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Paluxy River Watershed  
Erath, Hood, and Somervell Counties, Texas

FINAL ENVIRONMENTAL STATEMENT

Kenneth E. Grant, Administrator  
Soil Conservation Service

Sponsoring Local Organizations:

Bosque Soil and Water Conservation District  
Route 1, Bluff Dale, Texas 76433

Hood-Parker Soil and Water Conservation District  
Route 2, Weatherford, Texas 76086

Erath County Commissioners Court  
County Courthouse, Stephenville, Texas 76401

Hood County Commissioners Court  
County Courthouse, Granbury, Texas 76048

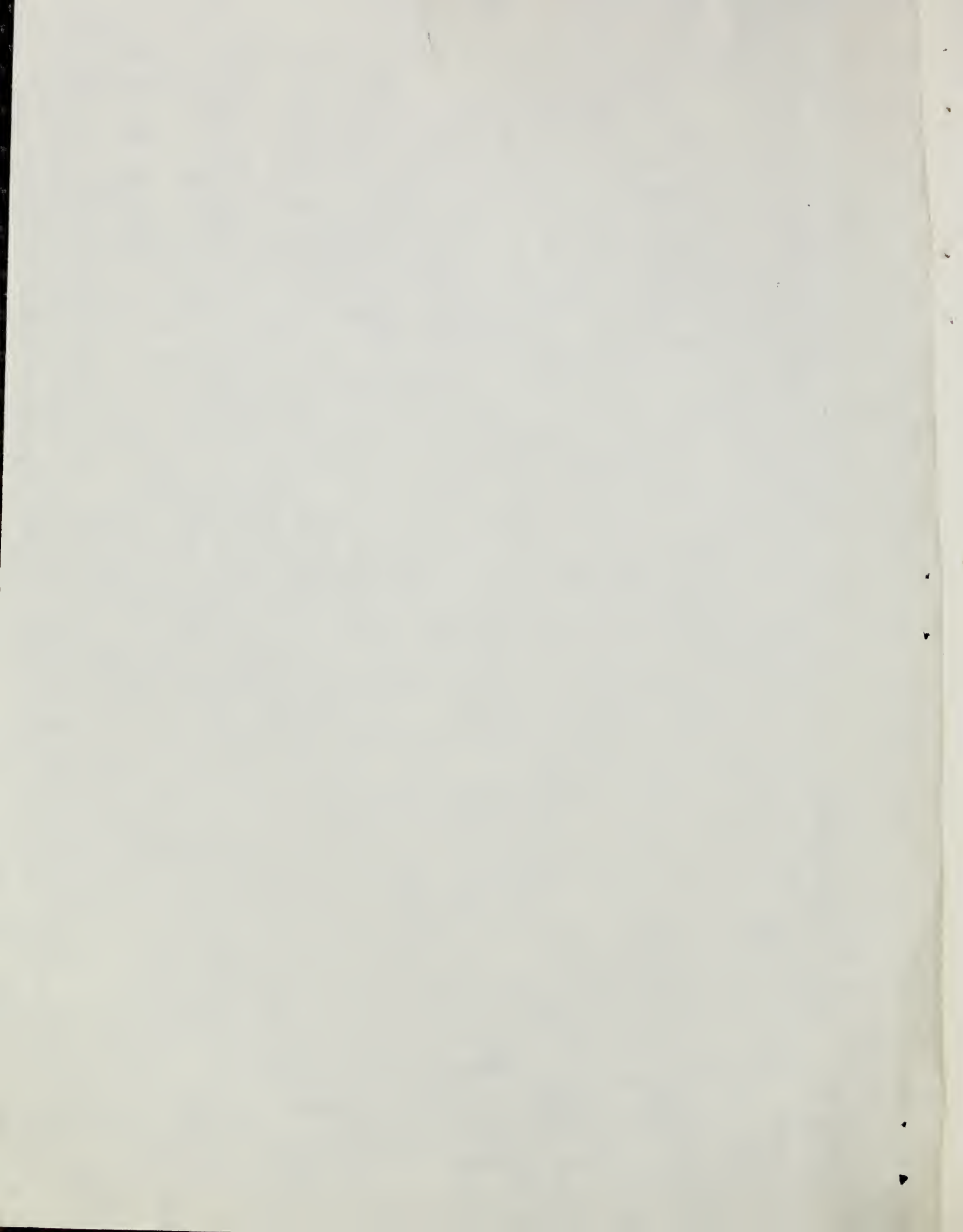
Somervell County Commissioners Court  
County Courthouse, Glen Rose, Texas 76043

City of Glen Rose  
Glen Rose, Texas 76043

May 1974

PREPARED BY

UNITED STATES DEPARTMENT OF AGRICULTURE  
Soil Conservation Service /  
Washington, D. C. 20250





## USDA ENVIRONMENTAL STATEMENT

Paluxy River Watershed Project  
Erath, Hood, and Somervell Counties,  
Texas

Prepared in Accordance with Sec. 102(2)(C) of P.L. 91-190

Summary Sheet

- I. Final
- II. Soil Conservation Service
- III. Administrative
- IV. Description of Action: This is a watershed project to be carried out by the sponsoring local organizations with assistance from the Soil Conservation Service, USDA, under the authority of Public Law 566, 83rd Congress, 68 Stat. 666, as amended, for the purposes of watershed protection, flood prevention, and agricultural and nonagricultural water management. The project, located in portions of Erath, Hood, and Somervell Counties, Texas, proposes that land treatment be accomplished on about 55,279 acres of grassland and cropland and that 23 floodwater retarding structures and 3 multiple-purpose structures be installed during an 8-year installation period.
- V. Summary of Environmental Impact and Adverse Environmental Effects: Action on the project will: reduce erosion and runoff; preserve and improve soil, water, fish, and wildlife resources; reduce flooding on agricultural, urban, and state park lands; reduce sediment, scour, and streambank erosion damages; reduce sediment deposition in Lake Whitney; provide municipal water and irrigation water; create 904 acres of surface water; improve economic conditions by increasing income, increasing demands for goods and services, and creating 165 man-years of employment during construction plus one additional man-year of employment over the evaluation period; require use of 1,028 acres of agricultural land; interrupt use of 2,592 acres of agricultural land occasionally; require clearing of 327 acres of woody habitat; eventually decrease the food supply for dove and quail on rangeland restored to climax grass vegetation; and initially reduce the average annual volume of streamflow at the USGS gage on the Paluxy River by 4.3 percent.
- VI. The Considered Alternatives to the Proposed Action Were: (1) An accelerated program of applying land treatment measures for watershed protection; (2) a program of land treatment measures, floodwater retarding structures, multiple-purpose structures, restrictions on construction in the flood hazard area, and providing flood insurance; (3) a program of land treatment measures, and one large multiple-purpose structure; (4) changing the present use of the land to one that is less susceptible to damage by flooding; and (5) foregoing the implementation of a project.

VII. Agencies from Which Comments Have Been Received

U. S. Department of the Army

U. S. Department of Health, Education, and Welfare

U. S. Department of the Interior

U. S. Department of Transportation

Environmental Protection Agency

Division of Planning Coordination (State agency designated by Governor  
and state clearinghouse)

VIII. Draft statement received by CEQ on April 9, 1973.



USDA SOIL CONSERVATION SERVICE ENVIRONMENTAL STATEMENT

Title of Statement: The Paluxy River Watershed Project  
Erath, Hood, and Somervell Counties, Texas

Type of Statement: Draft ( ) Final (X)

Date: December 1973

Type of Action: Administrative (X)

Statement:

1. Description

Authority for Project: Federal assistance through Public Law 566, 83rd Congress, 68 Stat. 666, as amended.

Sponsoring Local Organizations: Bosque Soil and Water Conservation District, Hood-Parker Soil and Water Conservation District, Erath County Commissioners Court, Hood County Commissioners Court, Somervell County Commissioners Court, City of Glen Rose

Purpose of Project: The purpose of the project is to provide watershed protection, flood prevention, and agricultural and nonagricultural water management.

Project Measures: The project plan provides for conservation land treatment measures, 23 floodwater retarding structures, and 3 multiple-purpose structures, of which 2 structures contain irrigation water supply and one structure contains municipal water supply.

Environmental Setting:

The Paluxy River watershed comprises an area of 249,920 acres, or 390.5 square miles. It drains the eastern part of Erath County, southwestern part of Hood County, and north central part of Somervell County.

There are no major towns or urban centers in the watershed. The small community centers of Morgan Mill and Bluff Dale, with populations of less than 100 each, lie within the watershed. Glen Rose, population 1,554, lies 3 miles downstream from the project on the Paluxy River. The city of Stephenville, population 9,277, is located 3 to 4 miles to the southwest and Granbury, population 2,473, is located about 15 miles to the northeast of the watershed. The large metropolitan centers of Fort Worth and Dallas are located about 75 miles to the northeast.

The watershed lies in the Texas-Gulf Water Resource Region. The Paluxy River is a tributary of the Brazos River and flows into the river downstream from Lake Granbury and upstream from Lake Whitney.

The principal problems in and immediately below the watershed are floodwater, scour, and sediment damages. Floodwater damage occurs on 16,854 acres of agricultural flood plain, 230 acres of flood plain in Dinosaur Valley State Park, and 416 acres of urban flood plain within Glen Rose. Overbank deposition of sediment is damaging 2,090 acres of flood plain land and 132 acre-feet of sediment is being carried into Lake Whitney annually from the project area. Streambank erosion is destroying an average of 2.74 acres of land annually and flood plain scour is damaging 5,750 acres of land. Erosion rates in the uplands are moderate and average about 2,588 tons per square mile annually.

The topography of the watershed ranges from gently to steeply rolling. The upper part of the watershed consists of a broad, gently rolling valley surrounded by a steeply rolling topography on the watershed divide. The steeply rolling topography converges into the valleys downstream, creating narrow incised flood plain valleys along the mainstem and larger tributaries in the central and lower parts of the watershed. Prominent escarped mesa-like hills rise above the surrounding rolling topography along the southern watershed divide. Elevations above mean sea level range from about 650 feet on the flood plain in the lowest reach to 1,500 feet in the headwaters.

The watershed is underlain by sedimentary rocks of Lower Cretaceous age. These rocks consist of poorly cemented sandstone, moderately hard to hard limestone, and soft shale. The beds have a regional dip of 40 to 50 feet per mile to the southeast.

Poorly cemented sandstone and soft shale of the Twin Mountains Formation crop out in the upper valley area surrounding the Morgan Mill and Bluff Dale communities. These rocks are covered by the alluvial flood plain soils on the mainstem and rocks of younger formations in the valley downstream from Bluff Dale. The sandstone of this formation is the source of spring flow in those streams having perennial flow. It is also an important ground water aquifer in Central Texas downdip from the outcrop.

Moderately hard to hard limestone and soft calcareous shale of the Glen Rose Formation lie above the Twin Mountains Formation. These rocks crop out along and near the watershed divide in the northern part and over most of the central and lower parts. The three types of dinosaur tracks which are exposed in the lower reaches of the Paluxy River and in the Dinosaur Valley State Park near Glen Rose occur in this formation.

The Paluxy Formation is made up of sandstone similar to the Twin Mountains Formation. It crops out in a relatively narrow band on the northeastern, northern, and western watershed divide and slightly below the southern watershed divide.



The southern watershed divide is underlain by several formations of the Fredericksburg Group. A gently rolling prairie occurs on soft calcareous shale and interbedded thin beds of hard fossiliferous limestone of the Walnut Formation. Prominent escarped mesa-like hills on the watershed divide are made up of soft limestone of the Comanche Peak Formation and are capped by hard, erosion-resistant limestone of the Edwards Formation.

Quaternary age terrace and alluvial deposits occur in the valleys of the mainstem and the major tributaries. The widths of these deposits range from 2,600 feet on the mainstem to less than 200 feet near the headwaters.

The watershed lies within two land resource areas: the Grand Prairie and the Cross Timbers. The Grand Prairie Land Resource Area occurs on the limestone and shale bedrock and comprises about 75 percent of the watershed. The soils of this area are generally shallow, gravelly to stony, calcareous, and fine textured. They are mainly of the Malaterre, Purves, and Dugout series, with minor areas of the Denton, Houston Black, and Brackett series. The main use is for rangeland with small areas of deeper soils used for cropland. Soils of the Cross Timbers Land Resource Area occur on the sandstone bedrock outcrop. These soils are deep, medium to coarse textured, and neutral to slightly acid in reaction. The major soil series include the Windthorst, Nimrod, Duffau, and Selden. These highly erosive soils were extensively cultivated in the past but large areas have now been converted to grassland.

The alluvial flood plain soils have been derived mainly from the Grand Prairie. These highly productive, nearly level soils are dark-colored, calcareous clay loams and loams. The major series are the Frio and Bosque. They are used for cultivation, improved pasture, and pecan production.

A recognizable first and second bottom flood plain occurs on the mainstem from the vicinity of Morgan Mill in the upper reach to the downstream reach near Dinosaur Valley State Park. The first bottom is narrow and poorly developed in the upper reach of the mainstem from Morgan Mill to Bluff Dale and on the South Paluxy River. Maximum development, with widths ranging from 400 to 1,000 feet, occurs downstream from the vicinity of Bluff Dale to the vicinity of the Hood and Somervell county line.

The average annual rainfall is about 30 inches. The months of April and May normally receive the greatest amounts; however, rainfall is fairly well distributed throughout the year. The January average temperature is 45° Fahrenheit and the July average temperature is 84° Fahrenheit.

The average date of the last killing frost in the spring is March 25 and that of the first killing frost in the fall is November 12, resulting in an average growing season of 232 days.

Mineral production in the watershed is limited to the extraction and local use of gravel from terrace deposits and soft limestone and calcareous bedrock materials for road construction and repair. There is no known oil, gas, or other mineral production in the watershed. The X-Ray Gas Field, scattered oil and gas wells, and an area which formerly produced coal lie to the northwest of the watershed.

The Twin Mountains Formation, which crops out in the Paluxy River valley in the upper central part, is an important ground water aquifer within as well as outside of the watershed. However, yield of water from individual wells is usually low because of the predominance of fine-grained sand in the aquifer. The quality and dependability are good. This aquifer supplies the domestic and livestock water needs in the watershed and is the source of municipal water for towns and cities surrounding the watershed. A small amount of ground water is also used for irrigation of improved pasture.

The over-all land use in the watershed is:

<u>Land Use</u>	<u>Acres</u>	<u>Percent</u>
Cropland	30,747	12
Rangeland	198,889	80
Pastureland	16,628	7
Miscellaneous <sup>1/</sup>	3,656	1
Total	<u>249,920</u>	<u>100</u>

<sup>1/</sup> Roads, railroads, farmsteads, villages, and state park.

The land use trend in the uplands is from cultivated land to grassland. Most of this change is occurring on the eroded Cross Timbers soils with smaller areas of marginal Grand Prairie soils also being converted. There is a trend toward the production of more hay and grazing crops on the remaining cropland.

The dominant vegetation in the watershed is that associated with the tall grass prairie. The Grand Prairie soils were originally covered with this vegetation and the Cross Timbers soils with a savannah-type vegetation that included post oak, blackjack oak, and the tall grasses. The important grasses of the tall grass prairie include little bluestem,

big bluestem, Indiangrass, switchgrass, perennial wildrye, sideoats grama, meadow dropseed, silver bluestem, and Texas wintergrass. Numerous palatable forbs also occur in this vegetation complex. Invading plants with grazing overuse include annual grasses, weeds, and mesquite on the Grand Prairie soils, and post oak and blackjack oak brush on the Cross Timbers soils. Scattered mottes of live oak occur on the Grand Prairie soils and thickets of Ashe juniper occur on many of the steep slopes and escarped areas in the southern part of the watershed.

The Paluxy River heads in northern Erath County about 10 miles north of Stephenville. It flows southeastward across southern Hood County and into the northern part of Somervell County. The project area ends about 3 miles upstream from the city of Glen Rose. The Paluxy River joins the Brazos River about 2 miles downstream from Glen Rose. Important tributaries lying in the Erath County portion include Pony, Sycamore, Richardson, Straight, Rough, Counts, Bee-Dee, Hightower, and Berrys Creeks and South Paluxy River. Large tributaries in the Hood County portion include Wolf and Prairie Creeks and Windmill and Goss Hollows. The major tributaries in the Somervell County portion are White Bluff Creek and Bowden Branch.

The flow of the streams in the watershed range from perennial on the mainstem and some segments of the larger tributaries to intermittent and ephemeral on the small tributaries. Perennial flow or perennial spring-fed waterholes occur on about 60 miles of the more than 200 miles of stream channels in the watershed having one square mile of drainage area or more. The remaining 140 miles or more have intermittent or ephemeral flow conditions.

All of the channels are classified as natural. However, most of these channels have undergone considerable enlargement due to entrenchment and bank erosion. Areas of active streambank erosion are still occurring in the central and lower reaches of the Paluxy River.

There are no large reservoirs in the project area. There are, however, four small privately owned lakes and numerous farm and ranch ponds scattered throughout the watershed. The quality of surface waters in ponds and streams is good with no serious pollution problems.

Most of the land in the watershed is privately owned and used for agriculture. There are only about 370 acres of state owned land in the watershed. This is within the Dinosaur Valley State Park. Agricultural income from the land is derived about equally from the sale of livestock and their products and crops. Agricultural land values range from \$100 to \$250 per acre, depending upon location and productivity.



There are about 575 farms and ranches, averaging about 435 acres, either wholly or partially within the watershed. About 490 of these are family-type units employing less than  $1\frac{1}{2}$  man-years of outside labor. About 85 are small low-income-producing units whose operators work off the farm in order to maintain an acceptable standard of living. It is estimated that about half of the total farm operators work off the farm. This varies from full-time employment to a day or so a week or seasonal employment such as custom harvesting of crops or feeding of livestock.

Normal flood-free yields per acre expected on the flood plain lands are: small grain, 60 bushels and  $1\frac{1}{2}$  animal unit months of grazing; grain sorghum, 3,000 pounds; corn, 50 bushels; improved pasture, 7 animal unit months of grazing; and rangeland, one animal unit month of grazing.

The cities of Stephenville, Glen Rose, and Granbury are the main marketing centers lying near the watershed. These cities offer good schools, churches, hospitals, services, and supplies. About 115 miles of paved highways and 147 miles of all-weather roads link the watershed with other population and marketing centers in all directions. Railway service is also available to the east and west.

The 1970 census of population, the latest period for which statistics are available, shows a population of 27,302 and a labor force of 8,425 for the three counties within which the watershed is located. The labor force represents 31 percent of the total populace. Slightly over 5.1 percent, or 430 workers, are unemployed. This is less than the national rate of unemployment but higher than the state rate. Approximately 21 percent, 1,770 workers, are employed in the agricultural sector.

The watershed lies within the Grand Prairie and the West Cross Timbers Game Regions. Wildlife resources are varied and include white-tailed deer, quail, mourning dove, fox squirrel, cottontail, opossum, raccoon, gray fox, bobcat, ringtailed cat, and skunk. The deer population is increasing throughout the watershed. Mourning dove numbers are moderate and quail low to moderate. Low numbers of waterfowl are found in the project area during the spring and fall migrations. Moderate numbers of squirrel occur along the wooded streambanks and low numbers occur in upland brushy or wooded areas. The future wildlife densities are expected to increase slightly due to improved game management techniques.

The golden-cheeked warbler occurs in the watershed. It is listed as threatened by the Bureau of Sport Fisheries and Wildlife in their Resource Publication 114, "Threatened Wildlife of the United States," March 1973. Approximately 4,000 acres of the virgin Ashe juniper



habitat required by this bird is found in the southern part of the watershed.

Stream fisheries are found on the spring-fed reaches of the Paluxy River and short reaches of spring-fed streams on the major tributaries. Lake fishery habitat occurs in four small privately owned lakes and about 600 farm and ranch ponds scattered throughout the watershed. The principal fish species include the largemouth bass, redear and green sunfish, bluegill, channel and flathead catfish, gizzardshad, carp, smallmouth buffalo, river carpsucker, and gray redhorse. There is no commercial fishing.

Recreation demand in the general vicinity of the project area is high because of closeness to the large Dallas-Fort Worth metropolitan area and the public interest in the newly created Dinosaur Valley State Park in the lower part of the watershed. Tracks of at least three species of dinosaurs (sauropods, ornithopods, and theropods) have been preserved in the limestone along the Paluxy River. Outdoor recreation includes visitation and viewing of dinosaur tracks at the park, some fishing and swimming at accessible spots along the Paluxy River, fishing in some of the privately owned small lakes and ponds, hunting of doves, quail, and deer on a lease basis, and some squirrel hunting. There is also some sport hunting of the furbearers, but little hunting of migratory waterfowl.

There are no known historic sites within the Paluxy River watershed listed in, or in the process of nomination to, the National Register of Historic Places. Archeologists from the Archeology Research Program, Southern Methodist University, made a comprehensive investigation of each of the floodwater retarding structure sites for the Soil Conservation Service and determined that there are no significant archeological resources within these areas. However, there is evidence of several archeological sites on downstream spring-fed reaches of the Paluxy River.

The Bosque Soil and Water Conservation District, with technical assistance from Soil Conservation Service personnel headquartered at Glen Rose and Stephenville, and the Hood-Parker Soil and Water Conservation District, with technical assistance from Soil Conservation Service personnel headquartered at Granbury, Texas, have assisted landowners and operators of watershed lands in the development of conservation plans and the application of needed land treatment measures.

The Bosque Soil and Water Conservation District was organized in 1941 and the Hood-Parker Soil and Water Conservation District was organized a short time later.

Conservation plans have been developed on 338 of the 575 operating units wholly or partially within the watershed. This represents 77 percent of the total agricultural land.

It is estimated that needed land treatment has been applied on about 55 percent of the agricultural land in the watershed. The total cost of this application is estimated at \$2,707,742.

Water and Related Land Resource Problems:

Approximately 45 percent of the agricultural land in the watershed needs additional conservation treatment for protection and planned improvement. The application and maintenance of land treatment measures is a continuing process of educating and assisting new landowners, as well as the older landowners, to develop an awareness of the needs of the land. The application of needed measures has been slow in the erosion damaged, formerly cultivated Cross Timbers soils because of low fertility. Cost associated with restoration of the fertility and establishing a soil-protecting, high value vegetation on these soils causes most landowners to limit application on smaller increments over a longer period of time. The treatment measures which have lagged most and have had less than 50 percent of needed application are pasture and hayland planting and pasture and hayland management. Measures which have more than 50 percent of needed application include conservation cropping system, terraces, diversions, proper grazing use, range seeding, brush control, and installation of ponds.

The principal problems in and immediately below the watershed are frequent damages from floodwater, sediment, and scour which occur on about 17,500 acres of flood plain, of which 16,854 acres are highly productive agricultural land, 230 acres are Dinosaur Valley State Park land, and 416 acres are urban land within Glen Rose.

Major floods resulting in severe damage occur on the average of once every three to four years. Minor floods occur on an average of more than once each year. Major floods during recent years occurred in 1949, 1952, 1955, 1957, 1959, and 1963. The flood of October 1949, having an estimated 6.6 percent chance of occurrence, produced a peak discharge of 48,500 cubic feet per second at the stream gage on the Paluxy River near Glen Rose and inundated an estimated 12,800 acres of flood plain. The maximum flood of record, which occurred in April 1908,



produced a peak discharge of 59,000 cubic feet per second at the same gage, flooded about 14,000 acres, and had a 4.6 percent chance of occurrence. It is estimated that the 1 percent chance of occurrence flood would inundate about 17,500 acres of flood plain.

The agricultural flood plain lands are used as follows: sorghums for hay and grazing, 32 percent; small grain, 29 percent; improved pasture, 7 percent; pasture, 31 percent; and miscellaneous uses such as farmsteads and roads, 1 percent. Flood plain lands have a market value of \$100 to \$250 per acre, depending upon location and productivity. Damages to crops and pasture, other agricultural property such as fences, livestock, and other property, and to roads and bridges are extensive.

The Texas Parks and Wildlife Department is currently developing Dinosaur Valley State Park on the Paluxy River in the lower portion of the watershed. The completion date should coincide fairly closely with the completion of the installation of this project for watershed protection and flood prevention. This park will encompass about 1,274 acres, of which 230 acres are within the flood plain. An interpretive complex with life-sized reproductions of the various species of dinosaurs whose tracks are exposed in the bedrock of the Paluxy River streambed will be built on the flood plain. Under without project conditions, the one percent chance flood would be expected to inundate the interpretive complex area of the park to depths of more than 6 feet.

Although a catastrophic flood has not occurred on the Paluxy River at Glen Rose since the city has been developed, such a threat exists. An analysis of hydrologic data indicates that the one percent chance flood would inundate a major part of the urban area of Glen Rose. About 60 businesses and 65 residences in the city of Glen Rose and 45 buildings at Glen Lake Methodist Camp are subject to flooding to depths of up to 9 feet.

Under nonproject conditions the estimated average annual direct monetary damage by floodwater within the benefited area is \$311,168. Of this amount, \$68,606 is crop and pasture; \$31,882, other agricultural; \$49,520, road and bridge; \$22,720, Dinosaur Valley State Park; and \$138,440, urban damage in and near Glen Rose.

Upland erosion in the watershed is moderate. The highly erosive Cross Timbers soils suffered severe sheet and gully erosion in the past. Erosion on these soils, as well as on the less erosive soils of the Grand Prairie, has been greatly reduced by land treatment, land

conversion, and grassland management. The most serious erosion is now confined to scattered small areas of severely eroded land and shallow gullies which are healing.

Streambank erosion is destroying an average of 2.74 acres of land in the watershed annually. Most of this destruction is occurring on the mainstem channel lying within Hood County and extending into northern Somervell County. Small amounts occur on the tributaries and the upper reaches of the mainstem. Older residents of the watershed state that severe bank erosion and associated channel entrenchment began with the large flood of 1908. Channel entrenchment has progressed upstream into the headwaters area of all tributaries lying on soft bedrock. Natural revegetation is stabilizing the erosive channels in most upstream areas. However, active bank erosion remains a problem on the mainstem as the existing sharp meanders migrate downstream and the larger floods destroy most of the natural woody vegetation which develops along the waterline of the banks.

The average annual value of damage by streambank erosion is \$9,273.

Flood plain scour damage in the watershed is moderate. Most of this damage occurs on second bottom flood plain, which is extensively cultivated. Little damage occurs in reaches where the first bottom is well developed. The damage is most severe in the reach between Morgan Mill and Bluff Dale. Large storms cause damage on an estimated 5,750 acres of flood plain soils through removal of topsoil by sheet scour on broad areas and deep scouring in narrow scour channels. Damages in reduced productivity of the soil range from 5 percent to 60 percent. The average annual value of damage by scouring is \$10,799.

Sediment derived from the watershed causes overbank deposition damage to flood plain soils along the Paluxy River and downstream damages to Lake Whitney reservoir on the Brazos River.

Overbank deposition damage occurs mainly on the first bottom of the mainstem flood plain and to a lesser extent on the flood plain along the tributaries. Damaging materials consisting of gravelly sand, sand, and sandy loam are being deposited on about 2,090 acres of flood plain land. Damages in reduced fertility and productivity of the soil by these materials range from 10 to 40 percent. The average annual damage from overbank deposition on flood plain lands is \$5,802.

An estimated average annual sediment load of 252,000 tons is delivered out of the watershed. The suspended portion of this sediment load represents a concentration of 2,900 parts per million in the average annual runoff. Deposition of suspended sediment, in addition to bedload

sediment derived from the watershed, results in an average annual depletion of 132 acre-feet of storage in Lake Whitney reservoir. The damage from this loss of storage space is estimated to average \$5,431 annually.

The amount of land being irrigated is small because ground water sources are not capable of producing water at high rates of production. No suitable surface supplies have been developed for this or municipal uses. There is a need for municipal and industrial water supply for the city of Glen Rose. Present supplies from ground water sources are adequate to meet immediate needs but will be inadequate to meet future projected needs. The following table presents the projected population and average daily water needs as determined by the consulting engineer employed by the city:

<u>Year</u>	<u>Population</u>	<u>Average Daily Use</u> (1000 gallons)
1970	1,554	155.4
1980	1,875	225.0
1990	2,250	315.0

The engineer employed by the city recommended that the city consider a surface water supply to meet its increased future water needs in lieu of expanding its pumping capacity.

A major problem affecting outdoor recreation is public accessibility to the Paluxy River and the ponds and small lakes located on private land. About 3.6 miles of the river will be opened for public access when all of the land has been acquired for the Dinosaur Valley State Park. There are no large reservoirs in the watershed. However, water-based outdoor recreation on larger reservoirs is available at nearby Lake Granbury and at slightly greater distances at Lakes Whitney and Possum Kingdom, all of which are located on the Brazos River. Several small lakes and some farm and ranch ponds are presently open to the public on a fee basis and most of the others are used by the landowners and their families and friends.

Availability of a dependable food supply is a problem for deer during the winter months in the West Cross Timbers Game Region. The trend of improving the land for the production of livestock by clearing of the virgin Ashe juniper thickets in the southern part of the watershed could be a threat to the golden-checked warbler if adequate consideration is not given to its habitat.



Sediment carried by the streams of the watershed is detrimental to the stream fishery habitat and the lake fishery habitat downstream in Lake Whitney.

The basic problems related to the economic sector are the high unemployment rate and the extent of underemployment, especially in the agricultural sector. There is a definite need for expansion and development of employment opportunities in the watershed area.

About 16 percent of the families in the 3-county watershed area were listed in the below poverty level class in the 1970 census. An expansion of the local economy is needed to raise income levels, especially those of the families now below the poverty level.

#### Planned Project:

The project measures to be installed in order to achieve the sponsors' objectives consist of a combination of conservation land treatment measures and structural measures. The objectives of the land treatment phase are the use of each acre within its capabilities and the treatment of each acre in accordance with its needs. The structural measures will be installed to provide flood protection to the flood plain lands, irrigation water storage, and municipal water storage.

Conservation land treatment measures will be applied on about 9,380 acres of cropland and 45,899 acres of grassland during an 8-year installation period. These measures will be applied in addition to maintaining those measures already applied in order to achieve effective treatment on about 80 percent of the land in the watershed. Land treatment measures planned for the watershed are those that will contribute directly to the preservation and enhancement of the environment in the watershed. Emphasis will be given to those measures which will reduce soil and water losses, assure proper functioning of the structural measures, reduce flooding, and preserve and improve the fish and wildlife resources of the watershed.

Conservation measures to be applied on cropland include conservation cropping system, crop residue management, diversions, terraces, and waterways in combinations necessary to provide adequate treatment. Conservation cropping systems primarily include strip cropping and crop rotation of small grain with and without legumes, grain sorghums, and forage sorghums.

Conservation measures which will be applied on pastureland include pasture and hayland planting and pasture and hayland management. Rangeland will be deferred and grazed properly. Invading brush will be controlled. The normal means of controlling brush in this area are mechanical (chaining and/or bulldozing). Ranch operators planning



brush control will be encouraged to accomplish this in a manner which will be compatible with the needs of wildlife for food and cover. Ranch operators doing any brush control in the virgin Ashe juniper thickets at the south edge of the watershed will be encouraged to consult with the Texas Parks and Wildlife Department and the soil and water conservation district so as to avoid eliminating the golden-cheeked warblers' nesting habitat. In addition to range seeding of areas on which brush control practices have been applied, the seeding of barren areas of sediment pools and adjacent soils will be encouraged to retard erosion and sedimentation and increase fertility in the impoundments. Farm ponds will be constructed to enable operators to defer grazing and use rangeland properly.

Land treatment measures planned to primarily benefit the fish and wildlife resources in the watershed are wildlife upland habitat management and fishpond management. Landowners will be encouraged to seek the advice of the Texas Parks and Wildlife Department in the management and stocking of their reservoirs for fish and the management of those waters for wildlife. Landowners will be encouraged to retain or create wildlife habitat and apply proper management to preserve and enhance the wildlife resources of the watershed. Upland wildlife habitat management will include such measures as planting small grains and/or legumes for food, retaining or planting areas of trees and shrubs along fence rows for wildlife food and cover, and doing any necessary brush control in such a manner that it is compatible with the needs of wildlife for food and cover.

A system of 23 floodwater retarding structures and 3 multiple-purpose structures will be installed during the last 7 years of the 8-year installation period to provide protection to the flood plain lands, municipal water for the city of Glen Rose, and irrigation water supply. The following is the planned sequence of installing the structural measures:

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 Planned Schedule of Construction
 

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Fiscal Year :	Measure
1st	No Construction Planned
2nd	Floodwater Retarding Structures 11, 12, and 19 and Multiple-Purpose Structure No. 17
3rd	Floodwater Retarding Structures 4, 6, 23, and 24 and Multiple-Purpose Structure No. 16
4th	Floodwater Retarding Structures 1, 2, 20, and 21
5th	Floodwater Retarding Structure 25 and Multiple-Purpose Structure No. 26
6th	Floodwater Retarding Structures 9, 10, 13, 14, and 15
7th	Floodwater Retarding Structures 3, 5, 7, and 8
8th	Floodwater Retarding Structures 18 and 22

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Runoff from 219.18 square miles, or 56 percent of the watershed, will be retarded by the structural measures (Appendix C, Project Map). The total storage capacity of the floodwater retarding and the multiple-purpose structures is 57,458 acre-feet, of which 7,360 acre-feet is for sediment storage, 48,976 acre-feet is for floodwater retarding storage, 422 acre-feet is for irrigation storage, and 700 acre-feet is for municipal water storage. The principal spillway crest elevation of all floodwater retarding structures will be set at the 100-year sediment capacity. The principal spillways for floodwater retarding structures Nos. 7, 13, 15, 18, 19, 20, 21, 22, 24, and 25 will be ported at the elevation of the 200 acre-feet capacity. All of the structures will have provisions to release impounded floodwater in order to perform maintenance, and if it becomes necessary, to avoid encroachment upon downstream water rights.

The maximum height of the structures will range from 39 feet to 80 feet. The surface areas of the pools at the lowest ungated outlet will range from 8 to 103 acres. The surface areas of the retarding pools will range from 29 to 378 acres.

A combination of principal spillway capacity and retarding storage will assure that emergency spillways of floodwater retarding structures will still have less than a 4 percent chance of use at the end of their design life. The principal spillways will be the drop inlet type with cantilever outlets.

Preliminary plans call for the delivery of water from the multiple-purpose structure to Glen Rose to be accomplished through release and free flow down Bowden Branch and the Paluxy River. The released flow will be picked up at Glen Rose by pump and transported through a short pipeline to the city's treatment plant.

The installation of the project will not result in the displacement of any person, business, or farming operation. It will be necessary to modify portions of several utility lines in order to install floodwater retarding structures Nos. 2, 11, 18, and 22. A number of low-water crossings affected by the release flows from the structural measures will be improved to make them passable during periods of prolonged flow.

Construction and operation of the structural measures will require 4,105 acres of land. This area includes 557 acres of cropland, 315 acres of improved pasture, 2,748 acres of rangeland, and 485 acres (56 miles) of intermittent stream channels. The dams and emergency spillways will require 359 acres of land, including 36 acres of cropland, 12 acres of improved pasture, and 311 acres of rangeland. The sediment and water supply pools will inundate 904 acres of land, including 119 acres of cropland, 89 acres of improved pasture, 461 acres of rangeland, and 235 acres (26 miles) of intermittent stream channels. The detention pools will temporarily inundate 2,842 acres of land, including 402 acres of cropland, 214 acres of improved pasture, 1,976 acres of rangeland, and 250 acres (30 miles) of intermittent stream channels.

It will be necessary to clear most of the woody cover on about 327 acres of wooded rangeland during construction. This clearing will result in the removal of the tree and brush canopy on the banks of the 26 miles of stream channels which will be affected by installation of the structural measures. The tree and brush canopy on the banks of the 8.6 miles of channels in the upper reaches of the sediment and water supply pools will not be cleared or destroyed. The dams, emergency spillways, and areas disturbed during construction except for the sediment and water supply pools will be planted with multi-use plants for erosion control, wildlife use, and grazing of livestock.

Preliminary studies indicate that adequate volumes of borrow materials for construction of the embankments of the floodwater retarding structures are available from within the sediment pool area at each site.



The final location of sources of borrow materials will be determined during the operation stage when detailed geologic investigations are made.

The environment will be protected from soil erosion and water and air pollution during construction. Contractors will be required to adhere to strict guidelines set forth in each construction contract to minimize soil erosion and water and air pollution during construction. Excavation and construction operations will be scheduled and controlled to prevent exposure of extraneous amounts of unprotected soil to erosion and the resulting translocation of sediment. Measures to control erosion will be uniquely specified at each work site and will include, as applicable, use of temporary vegetation or mulches, diversions, mechanical retardation of runoff, and traps. Motors of construction equipment will be required to have mufflers to reduce noise. Harmful dust and other pollutants inherent to the construction process will be held to minimum practical limits. Haul roads and excavation areas and other work sites will be sprinkled as needed to keep dust within tolerable limits. Contract specifications will require that fuel, lubricants, and chemicals be adequately labeled and stored safely in protected areas, and disposal at work sites will be by approved methods and procedures. Clearing and disposal of brush and vegetation will be carried out in accordance with applicable laws, ordinances, and regulations in respect to burning. Each contract will set forth specific stipulations to prevent uncontrolled grass or brush fires. Disposal of brush and vegetation will be by burying, hauling to approved off-site locations, or controlled burning, as applicable.

Stringent requirements for safety and health in conformance with the Construction Safety Act will be included in each construction contract.

Necessary sanitary facilities, including garbage disposal facilities, will be located to prohibit such facilities from being a pollution hazard to live streams, wells, or springs in conformance with federal, state, and local water pollution control regulations. Conformance to all environmental control requirements will be monitored constantly by a construction inspector who will be on-site during all periods of construction operation.

The environment will continue to be protected from erosion and water pollution following completion of construction. Project sponsors will operate and maintain the structural measures in accordance with a specific operation and maintenance agreement. The agreement will set forth the inspections to be made and the maintenance to be performed to prevent soil erosion and water pollution. Sponsors have given assurance that adequate sanitary facilities meeting local and state health standards will be provided at reservoirs prior to any recreational use.

All applicable state laws will be complied with in the design and construction of the structural measures, as well as those pertaining to storage, maintenance of quality, and use of water.

An archeological survey was made of all site locations of planned structural measures by the Archeology Research Program of Southern Methodist University under the direction of S. Alan Skinner as principal investigator. The survey was coordinated through the Texas Historical Commission. This survey found that there are no significant archeological resources located within the pool areas or construction areas of the planned floodwater retarding and multiple-purpose structures and concluded that additional studies of the archeology should not be necessary before construction begins at the planned structures. The Director, Southwest Region, National Park Service, will be kept informed of the progress of the plan.

The estimated cost of installation of the project is \$7,100,769. Of this amount \$2,521,416 is for planning and application of land treatment measures and \$4,579,353 is for installation of structural measures.

## 2. Environmental Impact

The installation of project measures, both land treatment and structural, will achieve the project objectives of watershed protection, flood prevention, and agricultural and nonagricultural water management.

The application of the land treatment measures will help to improve the productivity of the soil by reducing erosion and improving the fertility and infiltration properties of the soil. The measures will also reduce downstream floodwater and associated damages by reducing erosion and the peak rate of runoff from the upland and assuring the proper functioning of the structural measures. The habitat for fish and wildlife will also be generally improved by making food and water supplies more dependable.

The land treatment measures applied on cropland, in addition to reducing erosion and runoff and improving the productivity of the soil, will provide a better habitat for wildlife by leaving waste grain from grain crops on the surface for seed eating birds and providing green winter cover crops for food for wildlife such as deer and cottontails during this critical period. Control and removal of invading brush on over-used native grassland areas along with the grazing management practices will increase the protective ground cover and density of the natural plant community, including grasses and palatable forbs. Leaving units and patterns of woody cover in favorable locations will maintain the cover needed by deer, the golden-cheeked warbler, and other wildlife. The cleared areas will initially be highly advantageous to dove and quail because of weed growth in the disturbed soil. This advantage will decrease, however, as the native range vegetation recovers and reduces the amount of annual weed growth. Ponds installed for watering of livestock will also provide needed watering spots for wildlife, provide waterfowl resting areas, and provide a potential fish resource.

Installation of the project will protect 16,900 acres of flood plain land from floodwater and associated damages. The protected flood plain consists of 16,254 acres of agricultural land, 416 acres of urban land, and 230 acres of land in the Dinosaur Valley State Park. Average annual acres of agricultural land flooded will be reduced from 4,897 acres to 1,655 acres, or 66 percent.

If the project had been installed at the time of the October 1949 flood, only 4,800 acres instead of 12,800 acres would have been flooded. This is about 37 percent of the acreage estimated to have been inundated by that flood.

Use of the agricultural flood plain land is as follows: sorghums for hay and grazing, 32 percent; small grain, 29 percent; improved pasture,



7 percent; pasture, 31 percent; and miscellaneous uses, 1 percent. Little change in basic land use is anticipated in the foreseeable future; however, it is expected that about 1,500 acres of flood plain pasture will be managed more intensively. The reduction in flooding will enable operators to fertilize, control undesirable plants, and manage grazing more efficiently. This will help stabilize their income.

Change in floodflow patterns and the related energy forces acting on the streambanks of the watershed after installation of the structural measures is expected to reduce streambank erosion damage to valuable pasture and bearing pecan trees by 64 percent. Scour damages to fertile flood plain soils will be reduced by 62 percent.

The sediment load delivered from the watershed and deposited in Lake Whitney will be reduced from an average of 132 acre-feet to 55 acre-feet annually, a reduction of 58 percent. The average suspended sediment concentration carried by runoff water leaving the watershed will be reduced from 2,900 to 1,058 parts per million, based on average annual runoff of 48,850 acre-feet under without project conditions and 46,780 acre-feet under with project conditions. Overbank deposition damage to the flood plain lands will be reduced by 48 percent. Reduction of the sediment load carried by the Paluxy River will improve the fish habitat in this stream and in Lake Whitney downstream.

Some overbank deposition of sediment of a damaging nature is expected to continue to occur on the first bottom flood plain after project installation. This sediment consists of sand derived mainly from bed-load. The erratic nature and high rate of accumulation surpasses the natural soil forming processes.

Floodwater damages expected to occur to Dinosaur Valley State Park will be reduced by 92 percent. An interpretive complex is planned for the 230 acres of flood plain in the park. This will depict life-sized dinosaurs and other creatures in their natural habitat as it existed here eons ago. Under without project conditions, the 1 percent chance flood would be expected to inundate this area of the park to depths of more than 6 feet. Under the with project conditions, the maximum depth of flooding from this same flood would be less than 1 foot.

Urban damages in Glen Rose will be reduced by 96 percent. The project will provide protection from the 1 percent chance flood to all existing urban properties except four houses located at an extremely low elevation on Grace Street, three houses on Bernard Street, and several low-lying cabins and improvements at the Glen Lake Methodist Camp. The average depth in the homes subject to flooding from the 1 percent chance flood is 1.7 feet on Grace Street and less than 0.5 foot on Bernard Street. Damage to these homes will occur from only those floods exceeding the 2 percent chance event. Some damage will still

be experienced to facilities at Glen Lake Methodist Camp from floods exceeding those of the 4 percent chance event, with significant damage occurring only from floods exceeding the 2 percent chance event.

Average annual floodwater damages within the benefited area will be reduced by 82 percent. This includes crop and pasture, 72 percent; other agricultural, 70 percent; Dinosaur Valley State Park damage, 92 percent; Glen Rose urban damage, 96 percent; and road and bridge, 75 percent.

A maximum initial reduction in average annual runoff of 2,186 acre-feet is expected from the combined effects of evaporation losses from sediment and water supply pools and water use from the water supply pools of the multiple-purpose structures immediately after project installation. This will result in an initial reduction from 51,290 acre-feet to 49,104 acre-feet, or 4.3 percent, in average annual volume of streamflow at the USGS gage on the Paluxy River. Of this reduction, evaporation losses will initially amount to 3.2 percent. This initial water loss by evaporation will be reduced as sediment accumulates in the sediment pools over the life of the project. The average annual discharge of 1,210,000 acre-feet at the USGS gage on the Brazos River near Whitney, Texas, will be reduced less than two-tenths of one percent. This minor reduction in streamflow is not expected to have a significant effect on power generation at Lake Whitney. The quality of runoff from the Paluxy River is high and serves to dilute the more saline water of the Brazos River. The reduction in runoff is expected to have very little effect on the water quality of the Brazos River.

This project will provide flood protection to the owners and operators of about 125 farms and ranches, as well as the owners and occupants of about 65 homes and the owners and operators of about 60 business establishments in Glen Rose through a reduction in floodwater damages.

The provision for storage of supplemental irrigation water will provide water for irrigation of about 550 acres of improved pasture which is located in the immediate vicinity of multiple-purpose structures Nos. 16 and 17.

The visitors and users of Dinosaur Valley State Park and Glen Lake Methodist Camp will be less apt to have their visit interrupted by flooding.

The inclusion of storage capacity for municipal water in a multiple-purpose structure a few miles upstream from Glen Rose will further benefit the 1,554 residents of that city by providing a dependable yield of 363,000 gallons of good quality water per day. This will allow the city planners to plan for future growth and development in



an orderly manner. The water should require an average minimum treatment in order to meet health agency standards. Delivery of water from the multiple-purpose structure to Glen Rose will provide some augmentation of stream flow downstream from the structure. During periods of low or no natural stream flow, fish and wildlife resources will benefit.

Although detailed water quality data for the Paluxy River and its tributaries are not available, streams in this area normally have less than 300 parts per million of dissolved solids and an average sediment concentration of about 3,000 p.p.m. The water will be moderately hard with the prevalent carbonates being calcium and magnesium. The firm yield of the reservoir will supply an average of 150 gallons per day per capita to a population of 2,420. This exceeds the foreseeable needs of Glen Rose slightly but will provide for an adequate margin of safety, which is necessary when planning for the water needs of a city.

Water impounded in the sediment pools of the structures will create 904 acres of fish habitat. The pools are expected to provide an estimated 15,500 visitor-days of incidental recreation resulting from swimming, camping, fishing, and picnicking by local inhabitants and visitors. The 904 surface acres of water will also provide attractive resting areas for migrating waterfowl.

The dinosaur tracks which occur along the Paluxy River will receive flood protection from the measures included in the project.

The use of the 4,105 acres of land for the installation and operation of the project will impose certain restraints upon its future use. The land will be restricted to uses which will not interfere with the operation and maintenance of the structures or suffer significant property damage from temporary inundation.

The present use of the land required for installation of the structural measures is as follows: cropland, 557 acres; grassland, 3,063 acres; and stream channel, 485 acres. The expected future use is as follows: grassland, 2,335 acres; stream channels, 250 acres; and water areas, 904 acres. It is expected that the 359 acres of land occupied by the dams and spillways will be used by wildlife and livestock after revegetation. The productivity and composition of the vegetation within the detention pool areas is not expected to be altered significantly. The impoundment of permanent water in the deep channels will enhance greatly the wildlife habitat on the adjoining woody and open rangeland. Revegetation of land cleared in the construction areas with multi-use plants for both erosion control and wildlife use will provide high value wildlife habitat to offset the losses of woody vegetation destroyed by project installation.

The floodwater retarding structures will not detract from the natural scenic beauty of the watershed. The embankments of the structures will

blend in with the topography of the winding, deeply incised, narrow valleys lying in mostly open grassland. The permanent water stored in the sediment pools will form attractive bodies of water which will add to the natural beauty.

The project will help stimulate the economy of the trade area as a result of increased sales of farm equipment, petroleum products, seeds, feeds, fertilizers, services, and other items needed by the family. The standard of living of the residents of the watershed and Glen Rose will be raised due to increased net income. In addition, residents will feel more secure knowing that the fruits of their labor and monetary investments are not so likely to be washed away.

The increased use of fertilizer due to installation of the project is expected to occur on about 1,500 acres of improved pastureland to be established on the protected flood plain and 550 acres of existing improved pastureland which will receive supplemental irrigation. This increased use of fertilizer is estimated to amount to less than 3 percent of the total estimated annual use of fertilizer in the watershed by the end of the 8-year project installation period. The 1,500 acres of new pastureland represents about 4.8 percent of the total improved pastureland expected to be in the watershed and comprises about 0.6 of one percent of the total agricultural land. The cumulative effect of project-induced increased use of fertilizers on the overall quality of water is believed to be minor when viewed in relation to the total use of fertilizer in the watershed. Other important factors which will further minimize the overall effects is that the fertilizer is to be applied on permanently established growing vegetation, thus reducing losses by leaching, and that reduced flooding on about 5,000 acres of already existing fertilized improved pasture on the flood plain will result in less washing of nutrients from these lands.

Economic impacts on the local area resulting from the project will include additional requirements of fertilizer, petroleum products, farm equipment, and other related farm inputs. Also new fences, ponds for livestock water, livestock and hay barns, and other miscellaneous improvements will be required for proper management of the improved pastures. All of these additional expenditures will bring about an increased demand for related businesses and services.

It is expected that approximately \$71,700 in the form of increased income to households will be realized by the local economy annually. The increased needs of the entire economy will create the equivalent of about eleven permanent jobs for local residents.

During the construction stage of the proposed project, additional requirements for building materials, petroleum products, and other necessities will stimulate the economy. This construction will create approximately 165 man-years of employment, which will further strengthen the economy during the construction phase.



Operation and maintenance of the works of improvement will also create at least one more man-year of employment for the evaluation period.

An evaluation of installing the planned land treatment measures was not made in monetary terms. Experience has shown that conservation measures are essential to maintaining the productivity of the soil and that the cost of protecting the resource is a part of the production cost.

A summary of economic findings is attached as Appendix A.

3. Favorable Environmental Effects

- a. Reduce upland erosion and runoff.
- b. Preserve and improve the soil and water resources.
- c. Reduce floodwater and associated damages by 82 percent.
- d. Reduce sediment damage to flood plain soils by 48 percent.
- e. Reduce sediment contribution from the watershed to Lake Whitney by 58 percent.
- f. Generally improve fish habitat and aid wildlife through the installation of most land treatment measures and the structural measures.
- g. Reduce scour damage to flood plain soils by 62 percent.
- h. Reduce streambank erosion damages by 64 percent.
- i. Reduce flood damages in Dinosaur Valley State Park by 92 percent.
- j. Reduce flood damages in Glen Rose urban area by 96 percent.
- k. Provide a municipal water supply for Glen Rose.
- l. Provide an irrigation water supply.
- m. Create 904 acres of surface water for recreation, lake fisheries, and waterfowl resting areas.
- n. Improve the woody habitat bordering 77 acres (8.6 miles) of stream channel to be permanently inundated by the sediment and water supply pools.

- o. Increase income to households in the immediate locale by \$71,700 annually.
- p. Create the equivalent of 11 permanent jobs through increased demand for goods and services, which will reduce unemployment in the local area.
- q. Create approximately 165 man-years of employment during the installation period through installation of the structural measures.
- r. Create one additional man-year of employment for the entire evaluation period for operation and maintenance of the works of improvement.

4. Adverse Environmental Effects Which Cannot Be Avoided

- a. Restrict the future land use on 4,105 acres of land needed to install and operate the structural measures.
- b. Require the land use be changed on 557 acres of cropland, 728 acres of grassland, and 235 acres of stream channel of the 4,105 acres needed to install the structural measures.
- c. Result in occasional interruption of the use of 2,842 acres of land in the retarding pool areas subject to temporary inundation.
- d. Require the temporary clearing of all vegetation on 359 acres and the permanent clearing of all the vegetation on 904 acres.
- e. Eventually decrease the food supply for dove and quail on the rangeland restored to climax prairie vegetation.
- f. Initially reduce the average discharge by about 4.3 percent at the gage on the Paluxy River near Glen Rose, Texas, and less than two-tenths of one percent at the gage on the Brazos River near Whitney, Texas.



## 5. Alternatives

The considered alternatives to the proposed project action were:

(1) An accelerated program of applying land treatment measures for watershed protection; (2) a program of land treatment measures, floodwater retarding structures, multiple-purpose structures, restrictions on construction in the flood hazard area, and providing flood insurance; (3) a program of land treatment measures and one large multiple-purpose structure; (4) changing the present use of the land to one that is less susceptible to damage by flooding; and (5) foregoing the implementation of a project.

A discussion of each alternative follows:

Alternative No. 1 - Alternative No. 1 consisted of only applying the land treatment measures as proposed in the project action. Most of the impacts of the application of land treatment measures are discussed under environmental impact of the proposed project action. Average annual damages from floodwater would be reduced by 2.5 percent in downstream areas. The volume of sediment being delivered to the mouth of the watershed would be reduced from 121 acre-feet to 111 acre-feet annually, a reduction of 8 percent. This alternative would have very little effect in reducing flood plain scour on the cultivated flood plain and in reducing the volume of sediment produced by this process. The adverse impacts that would be caused by installation of the structural measures would be eliminated. The estimated cost of this alternative is \$2,521,416.

Alternative No. 2 - Alternative No. 2 consisted of applying land treatment for watershed protection; installing floodwater retarding structures Nos. 1, 2, 4, through 13, 15, 19, 20, 23, and 24 for reducing flooding, and multiple-purpose structures Nos. 16, 17, and 26 for flood protection and storing irrigation water or municipal water; regulation of new development in the flood hazard area to prevent damages to new construction; and providing flood insurance to reduce the economic loss to an individual or small business.

Flood damages to the agricultural flood plain would be reduced by about 65 percent, to Dinosaur Valley State Park by about 75 percent, and to the urban area of Glen Rose and the Glen Lake Methodist Camp by about 70 percent. Depth of flooding from the 1 percent chance event would be reduced in the urban area of Glen Rose and Glen Lake Methodist Camp by about 5 feet. The volume of sediment carried out of the watershed

would be reduced from 2,900 parts per million to 1,480 parts per million, a reduction of about 49 percent. A reconnaissance-type survey of urban properties indicated that complete flood proofing could be accomplished on only a small portion of the improvements because of the type of construction and the depth and velocity of expected flooding. Many of the improvements could be expected to be washed off their foundations. Flood insurance would not reduce flooding and the resulting damages, but would reduce the risk of large economic losses by individual flood victims. Flood insurance would not eliminate the interruptions to the daily lives of the residents or the loss of much irreplaceable property. Restricting new development into the flood plain would prevent the flood damages from increasing.

Installation and operation of the structural measures would require the use of about 2,900 acres. The land would be used for the following purposes: construction of dam and spillways (114 acres), storage of municipal and irrigation water and sediment (640 acres), and temporary storage of floodwater (1,834 acres). The future land use of this land would be restricted.

It is estimated that this alternative would cost \$5,847,205 to install. This cost estimate includes \$2,521,416 for installing land treatment measures and \$3,325,789 for structural measures. No estimate of the average annual cost for providing flood insurance to the community was made.

Alternative No. 3 - Alternative No. 3 consisted of applying land treatment measures for watershed protection and a waterflow control structure across the Paluxy River immediately above the Dinosaur Valley State Park. The U. S. Army Corps of Engineers has made preliminary studies of this location. The impacts of applying the land treatment would essentially be the same as discussed in other parts of the statement.

The structure would control the runoff from about 361 square miles and could provide municipal water for the city of Glen Rose.

The structure would reduce flood damages to the Dinosaur Valley State Park, the urban area of Glen Rose, the Glen Lake Methodist Camp, and 275 acres of agricultural land. The total amount of flood plain that would receive flood protection would be about 920 acres. The structure would not provide flood protection on the flood plain above the structure. The installation of the structure would cause a commitment of a large amount of productive land (9,000 acres), displacement of several persons and farming operations, and require modification of the transportation system. The reservoir created by the structure would inundate a portion of the Paluxy River channel, which is a permanent flowing stream, and, of necessity, destroy some wildlife habitat. The Corps of

Engineers estimated the installation cost of the structure would be about \$24,000,000 at 1970 price levels.

Alternative No. 4 - Alternative No. 4 consisted of changing the present use of the land to one that is less susceptible to damage by flooding.

The potential land uses, listed in order from highest to lowest susceptibility to flood damage, are urban and built-up, cropland, pastureland, and rangeland. Land used for other purposes, such as transportation systems and wildlife-recreation land, are damaged to varying degrees by flooding, depending upon the type of development and depth and duration of flooding.

In order to reduce the need for flood protection, it would be necessary to relocate 60 business establishments, 65 homes and associated improvements within the urban area of Glen Rose, and 45 buildings located in the Glen Lake Methodist Camp; change the land use on about 11,460 acres of land used for growing crops and improved pastures; and stop the installation of improvements in that portion of the Dinosaur Valley State Park which is located in the flood hazard area. The land could be used for rangeland, pastureland, or for wildlife-recreation land if extensive developments were not installed.

This alternative would significantly reduce the actual monetary damage caused by floodwater, sediment, and erosion. Changing the land use from cropland to rangeland would reduce the food supply for many species of wildlife that are present in the watershed. Damages to the transportation system would continue at approximately the same rate because it was determined to be impracticable to move the transportation system out of the flood hazard area. The economic returns to the owners and operators of the 11,460 acres of agricultural land would be reduced by about \$229,200 annually if the land use were changed to rangeland. The opportunities for the public to view the paleontological treasures in their natural setting would be foregone. The relocation of 60 residences and 65 businesses would require changed land use on the land needed for the relocations, which would undoubtedly create adverse impacts on fish and wildlife resources, contribute to noise and air pollution, and adversely affect the other businesses in Glen Rose.

It is conservatively estimated the out-of-pocket costs of this alternative would be about \$7,000,000.

Alternative No. 5 - Alternative No. 5 consisted of foregoing the implementation of a project.

This would delay the application of land treatment measures, which would delay the impact these measures have on reducing sediment production from the watershed and would also delay the impact these measures have



in reducing flood damage. However, it is reasonable to expect that the landowners and operators would eventually install the land treatment measures to maintain the productivity of their lands.

Flooding would continue, resulting in damage to the agricultural land, Dinosaur Valley State Park, urban and built-up areas in Glen Rose, and the transportation system.

The deterioration of the cultivated flood plain soils by scour would continue until the cumulative effect of this damage forced land use conversion to less productive uses.

Increased grazing pressure on the grasslands of the watershed is causing more intensive use of the rangeland by the landowners through the application of various management techniques, including the clearing of brush. It is reasonable to expect that much of the virgin Ashe juniper would be indiscriminately cleared if technical assistance were not available to the landowner to plan and carry out his conservation practices.

Streambank erosion would continue to destroy an average of 2.74 acres of flood plain land annually.

Areas subject to scour and streambank erosion would continue to produce sediment.

The opportunity to store water for irrigation development in two multiple-purpose structures and municipal water supply in one multiple-purpose structure would be foregone.

The adverse impacts caused by installing the structural measures would be eliminated. These adverse impacts are listed under the section Adverse Impacts Which Cannot Be Avoided.

The creation of 904 acres of surface water which could be used for recreation, fish, and wildlife would be foregone.

The opportunity to realize about \$170,896 in average annual net benefits would be foregone.

#### 6. Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

The land in the watershed is being used primarily for agricultural production. However, there is a growing trend toward greater use of the Paluxy River valley, especially the Somervell County area, for recreation because of the natural scenic beauty and the nearness (within 75 miles) to the Dallas-Fort Worth metropolitan complex. The new Dinosaur Valley State Park, along with the numerous existing and planned church, civic, and private camps in the area, is increasing recreational use and development. Most of this activity is now, and will continue to be, centered

along the flood plain adjoining the rock-bottomed, permanently flowing lower reaches of the Paluxy River, where the tracks of several species of dinosaurs are exposed. The overall use of land in the watershed, however, will continue to be dominantly agricultural in the future. This is desirable for maintaining the rural environment into which the urban dweller is seeking to escape.

The overall projected land use in the watershed at end of project installation period is as follows:

<u>Land Use</u>	<u>Acres</u>	<u>Percent</u>
Cropland	26,085	10
Rangeland	188,721	76
Pastureland	31,234	12
Miscellaneous <sup>1/</sup>	3,880	2
Total	249,920	100

<sup>1/</sup> Roads, railroads, farmsteads, villages, and state park.

The land use change trend of conversion of cropland to pastureland and the increase in pastureland reflects the effects of rising production costs for producing crops on small units of marginal cropland and the increasingly more favorable economic returns being experienced from producing beef and animal products on intensively managed pastureland. The installation or failure to install the project will have little or no effect on this trend. The conservation land treatment program is flexible for meeting the treatment needs of changing land uses in order to protect and improve the soil, water, and vegetative resources for the future.

The project will provide adequate protection for the recreational facilities in Dinosaur Valley State Park, the urban area of Glen Rose, and the agricultural flood plain. This protection will also be adequate for expected future recreational facilities which may be developed on the flood plain in the lower reaches of the Paluxy River. Protection will be provided for up to and exceeding the 1 percent chance event for the normal and higher lying flood plain areas. Some minor flooding on a few acres in Dinosaur Valley State Park, with but little damage, can still be expected. Low-lying flood plain land and old slough areas will be subject to minor damages from floods having a 4 percent chance of recurrence. Significant damages will result from only those floods having a 2 percent chance or less of recurrence.

The Paluxy River watershed project is within the Brazos River Basin. The Brazos River drains portions of New Mexico and one-sixth of the state of Texas. The total area of the basin is about 44,640 square miles, of which an estimated 9,240 square miles do not contribute surface runoff to the river. The total length of the Brazos basin is about 600 miles and the maximum width is 120 miles. Mean annual precipitation varies from about 17 inches in the upper portion to about 46 inches at the mouth.

There are 56 watersheds located in the Brazos River Basin on which watershed projects have been installed, approved for operations, or appear to be feasible for planning. Sixteen of the projects are installed or are in the process of being installed, nine have been approved for operations, eight are currently being planned, and 23 appear to be feasible for planning. The total drainage area of the 56 watersheds is about 9,300 square miles. The drainage area of these watersheds is about 20.8 percent of the drainage area of the Brazos River Basin. Of the 23 watersheds which appear to be feasible, applications for planning assistance have been made to the Texas State Soil and Water Conservation Board on 11. The Paluxy River flows into the Brazos River downstream from Lake Granbury and upstream from Lake Whitney. It drains the only watershed located in the intervening drainage for which a watershed project is likely to be planned.

The Texas Water Plan (Summary) indicated that in 1968 there were 33 reservoirs either existing or under construction which have total capacities of 5,000 acre-feet or more. Based on the report of the U. S. Study Commission-Texas, there are about 90 reservoirs, excluding structures installed under the watershed program, in the basin with capacities of less than 5,000 acre-feet.

There are 337 floodwater retarding structures, 3 multiple-purpose structures, and 156.5 miles of stream channel improvement constructed or planned in the 25 watershed projects that are installed or approved for operations. It is estimated that if all the remaining projects that appear feasible were installed, a total of about 690 structures and 280 miles of open channel would be constructed in the basin.

It is anticipated that the works of improvement proposed in this project, along with works of improvement in the projects which are authorized for construction, will have significant impacts on the quality of the human environment. The long-term cumulative impacts of the projects in the Brazos River Basin and the region are as follows: The works of improvement, both land treatment and structural, will help contribute to conservation, development, and productive use of the soil, water, and related resources. The projects will allow the productivity of the resources to be sustained economically and indefinitely. The standard of living of the residents of the region will be improved through added income. The projects will restrict the use on the land needed for installation of the works of improvement. The vegetation will be destroyed on the land used to store water until displaced by sediment and will be temporarily disturbed on the land used to build the structural measures. This will adversely affect the wildlife in the immediate site areas. However, the overall habitat conditions are expected to become more favorable as a result of a more dependable food and water supply and better management techniques. The 904 acres of surface water that will be created by this project and the 11,287 acres of surface water that will be created by the projects either installed or approved for operations will provide a total of 12,191 acres of surface water which can be used for recreation, lake fisheries, waterfowl resting areas, etc.



The land treatment measures and the floodwater retarding structures will reduce the sediment being delivered to downstream reservoirs, thereby prolonging their usefulness. The significant impacts this project will have on the streamflow of the Brazos River are isolated between Lake Granbury and Lake Whitney. These impacts have been discussed previously in the statement.

The long-term habitability and contribution to the economic well-being of the area will be improved with only minimal detriment to a few features of the existing environment. In total, the natural environment and aesthetic values of the area will be benefited over those that would exist in the long-term without project measures.

#### 7. Irreversible and Irretrievable Commitments of Resources

Installation of the project will require the use of 4,105 acres of land. The dams, emergency spillways, sediment and water supply pools will require 1,263 acres and the detention pools will require 2,842 acres. The land use of the 1,263 acres needed for the construction of the dams and emergency spillways and the land that will be inundated by the sediment and water supply pools is as follows: cropland, 155 acres; improved pasture, 101 acres; open rangeland, 445 acres; wooded rangeland, 327 acres; and intermittent stream channels, 235 acres (26 miles).

The land use of the 2,842 acres of land which is subject to temporary inundation by floodwater is as follows: cropland, 402 acres; pastureland, 214 acres; rangeland, 1,976 acres; and stream channels, 250 acres (30 miles). It is expected that the cropland will be converted to grassland and the land use on the remainder will not change as a result of project installation.

Installation of the project will also require the commitment of labor, materials, and energy for construction.

No other commitment of resources is known to be required for this project.

#### 8. Consultation with Appropriate Federal Agencies and Review by State and Local Agencies Developing and Enforcing Environmental Standards

##### a. General

The application for assistance for the Paluxy River watershed was submitted to and approved by the Texas State Soil and Water Conservation Board. The plan was developed in full consultation and cooperation with all interested agencies and individuals. Written notification of initiation of work plan development was sent to

all federal, state, and local agencies that might have an interest in the project, soliciting information, comments, and participation. Contacts were made with several agencies during planning to obtain information and assistance. Most of the agencies furnished available information or suggestions of items to consider during project formulation. Contacts were made with several of the agencies during planning to coordinate activities or obtain assistance. The Bureau of Sport Fisheries and Wildlife, Department of the Interior, in cooperation with the Texas Parks and Wildlife Department, made a reconnaissance survey of the fish and wildlife resources of the watershed. This report was invaluable in plan formulation. The Corps of Engineers, U. S. Department of the Army, was contacted to determine the status of its study to determine the feasibility of constructing a flood control dam across the Paluxy River. A meeting was held with representatives of the Texas Water Rights Commission and the Brazos River Authority to coordinate this project with the River Authority's plans and to assure that the state laws concerning the storage and use of water would be complied with. A study of the watershed was made with representatives of the Texas Forest Service to determine if there were any forest management possibilities.

A brief reconnaissance survey of several of the proposed floodwater retarding structure sites was made by archeologists from the State Building Commission and Southern Methodist University to determine if any archeological sites of scientific value would be affected by these measures. The State Historical Survey Committee was contacted to determine if there were any known archeological or historical sites either listed in, or nominated to, the National Register of Historic Places that would be adversely affected by the installation of measures included in the project.

Public meetings were held during planning to explain the program and solicit public reaction and participation. An informal field level review was held in the watershed on May 24, 1973, at which time interested agencies were invited to present their views and recommendations either orally or in writing. The work plan and environmental statement have been prepared in consideration of such comments and recommendations as were provided by the agencies who reviewed the plan.

b. Discussions and Disposition of Each Problem, Objection, or Issue Raised on the Draft Environmental Statement by Federal, State, and Local Agencies, Private Organizations, and Individuals

Comments were requested from the following agencies:

- U. S. Department of the Army
- U. S. Department of Commerce

U. S. Department of Health, Education, and Welfare  
U. S. Department of the Interior  
U. S. Department of Transportation  
Environmental Protection Agency  
Federal Power Commission  
Division of Planning Coordination (State agency designated by  
Governor and state clearinghouse)  
North Central Texas Council of Governments

All of the above agencies except the Department of Commerce, the Federal Power Commission, and the North Central Texas Council of Governments responded. The comments and disposition for each is as follows:

U. S. Department of the Army

Comment: The Department did not foresee any conflict with any projects or current proposals of the Department. They also stated that the draft environmental statement is satisfactory insofar as they are concerned.

Response: Noted.

U. S. Department of Health, Education, and Welfare

Comment: The Department stated:

"Environmental health program responsibilities and standards of the Department of Health, Education, and Welfare include those vested with the United States Public Health Service and the Facilities Engineering and Construction Agency. The U. S. Public Health Service has those programs of the Federal Food and Drug Administration, which include the National Institute of Occupational Safety and Health and the Bureau of Community Environmental Management (housing, injury control, recreational health and insect and rodent control).

"Accordingly, our review of the Draft Environmental Statement for the project discerns no adverse health effects that might be of significance where our program responsibilities and standards pertain, provided that appropriate guides are followed in concert with State, County, and local environmental health laws and regulations.



"We therefore have no objection to the authorization of this project insofar as our interests and responsibilities are concerned."

Response: Noted.

U. S. Department of the Interior

- (1) Comment: The Department stated that the proposed project will not adversely affect any existing, proposed or known potential units of the National Park system nor any historic, natural or environmental education sites eligible or considered potentially eligible for the National Landmark Program.

They also stated that it would not impact on the program of the Bureau of Reclamation. The Department requested that the Director, Southwest Region, National Park Service, P. O. Box 728, Santa Fe, New Mexico 87501, be kept informed of the progress of this proposal so that any necessary archeological work appropriate to the post-authorization phase can be programmed for completion prior to the start of project construction.

Response: Noted. The plan and statement have been modified to specify that the Director, Southwest Region, National Park Service, will be kept informed of the progress of the plan instead of the Secretary of the Interior as originally specified.

- (2) Comment: The Department stated that insofar as can be determined without an on-site examination, the project would have no adverse effect upon the mineral resource base or mineral developments in the immediate or surrounding areas.

Response: Noted.

- (3) Comment: The Department stated: "We believe this project could have beneficial effects on fish and wildlife if the recommendations in the Bureau of Sport Fisheries and Wildlife's report of April 14, 1969, are implemented. We note, however, that landowners are to be encouraged to carry out the measures for protecting fish and wildlife rather than obligated to protect these resources. We believe the Soil Conservation Service should take a more positive stand on the protection of fish and wildlife resources and recommend that as a condition of

project authorization, non-Federal interests be required to implement the fish and wildlife protection measures insofar as it is consistent with the provisions of Public Law 566.

"The basis for our recommending that non-Federal implementation of plans to protect fish and wildlife be mandatory is that in accordance with your guidelines, protection of fish and wildlife is already encouraged. However, in discussing alternative 5 in the draft statement, it points out that due to grazing pressure, brush clearing is expected to continue at an accelerated rate in the absence of the project. Hence, much of the virgin ashe juniper thicket, at the south edge of the watershed, would be indiscriminately cleared, thereby eliminating or reducing nesting habitat for the golden-cheeked warbler. If this foregoing assessment is reasonably accurate, there is a valid basis for questioning the success of programs which are based on encouraging implementation by the agricultural interests."

Response: The discussion of alternative No. 5 has been clarified to point out that it is reasonable to expect that much of the virgin Ashe juniper would be indiscriminately cleared if technical assistance were not available to the landowners to plan and carry out his conservation practices.

The Soil Conservation Service has taken as positive a stand to protect the fish and wildlife resources as it has the power to do so within the provisions of Public Law 566. Neither the Service nor any of the local sponsors has the authority to require the owners of private land to manage their lands in such a manner as to protect any particular special interest such as fish and wildlife. The landowner has the right to manage his land for the resources he desires as long as he does not violate any applicable law or regulation. The Service and the sponsors furnish technical assistance to the land user in planning and applying conservation measures. The Service has long recognized the importance of the nation's fish and wildlife resources and through existing programs has done probably more than any other agency in getting the private landowner to consider the fish and wildlife resources when he develops a conservation plan and applies conservation measures. When furnishing technical assistance to land users, the Service technicians are instructed to locate and identify habitat for endangered species and to encourage the land

user to treat the land in such a manner to preserve and enhance the habitat. In the case of the golden-cheeked warbler, land users are encouraged to leave the mature junipers and to thin dense stands of young trees. The Service also publicizes the value of habitat protection and improvement through radio, television, press release, informational exhibits and personal contacts.

- (4) Comment: The Department stated that based on the information in the work plan and draft statement, they did not arrive at the same conclusion that land treatment measures will preserve and improve wildlife resources. It was further stated that since the work plan and environmental statement both explain that improvement of grassland will reduce the food sources for dove and quail over the long term, that it will also reduce food sources for deer. They suggested that ". . . a more detailed discussion on the specifics of land treatment and the beneficial effects on wildlife would provide the necessary support to your finding that land treatment will preserve and improve wildlife resources."

Response: The Soil Conservation Service believes the explanations of land treatment measures under Planned Project and Environmental Impact are adequate to show that the overall impact of the project will be to preserve and improve water quality for better fish habitat and to generally aid wildlife. Reference to fish and wildlife in item 3.b. of the section on favorable environmental effects was deleted. Item 3.f. was added as follows: "Generally improve fish habitat and aid wildlife through the installation of most land treatment measures and the structural measures." The Service does not agree with the correlation of food resources between quail and deer. The food resources in question are those annual forbs which would ultimately be reduced on rangeland restored to climax grass vegetation. The Service agrees that deer are browsers, but does not agree that their food supply would be decreased as in the case of quail and dove. Although rangeland restored to climax vegetation would consist of fewer annual forbs, there would be a corresponding increase in perennial forbs. Deer in this region of the state are known to prefer these perennial forbs. In addition, land treatment practices such as selective brush control and cover cropping would increase or maintain the food supply for deer in this region of Texas. Therefore, we do



not agree with the suggestion that a reduction of quail and dove food resources on rangeland restored to climax vegetation would apply to deer also.

- (5) Comment: The Department proposed the following correction in the second sentence of the second paragraph on page 8 of the work plan and in the last paragraph on page 6 of the environmental statement in order to reflect a recent change: "It is listed as threatened by the Bureau of Sport Fisheries and Wildlife in their Resource Publication 114, Threatened Wildlife of the United States, dated March 1973."

Response: The corrections were made as suggested.

- (6) Comment: The Department requested that the report of the Bureau of Sport Fisheries and Wildlife accompany the work plan when it is forwarded to Congress.

Response: The report will be forwarded as suggested.

- (7) Comment: The Department stated that they believe that interest groups such as the National Wildlife Federation, The Sierra Club, Audubon Society, etc., might also provide some valuable insights on this proposal and suggested that we consider their inclusion in the group selected to review our draft statement.

Response: It was considered that a formal review by the listed federal and state agencies was adequate. The public information program carried on in area newspapers, on radio and television, and public meetings during the planning process was considered adequate for giving all interest groups an opportunity to contribute to the proposed project. However, an information copy of the draft environmental statement was transmitted to the Natural Resources Defense Council, Friends of the Earth, and the Environmental Defense Fund.

- (8) Comment: The Department stated that they were pleased to note that it has been determined that no properties listed in the National Register of Historic Places will be affected by the project, and that it has been further determined that no properties now known to be eligible for nomination to the National Register will be affected. The Department also stated that they trusted that the Texas State Historic Preservation Officer had been consulted in making these determinations.

Response: Noted. The Texas Historical Commission commented on the work plan and the draft environmental statement.

- (9) Comment: The Department stated that at the present time they believe the discussion of cultural resources in the subject document is insufficient for environmental purposes, and that a qualified professional archeologist should survey all lands to be disturbed by proposed structural and conservation measures and areas to be cleared in connection with construction activities.

Response: A survey has been made of the area involved in the floodwater retarding structures and multiple-purpose structures by an archeologist. The survey was coordinated through the Texas Historical Commission (the responsible state agency). The results of this study have been incorporated into the final work plan and statement.

- (10) Comment: The Department commended the concern for protection of the paleontological resources of Dinosaur Valley State Park.

Response: Noted.

- (11) Comment: The Department stated that the last paragraph on page 12 should be expanded to discuss how much invading brush is to be controlled and what methods of control will be used.

Response: The discussion of land treatment measures to be installed contains only a listing of the types of measures which the soil and water conservation districts and the Soil

Conservation Service will encourage private landowners to install. The amounts of each practice which will be applied will depend upon the landowner's planned use for his land and the needs of the land. The intent of the discussion is to point out that the district and the Service will encourage the landowners to give adequate consideration to all resources in developing a conservation plan for his lands and in carrying out the plan. To specify the actual amounts of each practice that are to be applied in the watershed would mislead the reader. It would indicate that the district and/or the Service has the power to force private landowners to install specified measures. The landowner makes the final decision on the type of measures he will apply in order to achieve the basic goal for sustained safe use of the soil and water resources. Based on past history, this approach to getting the landowners to give adequate consideration to all resources has proven successful. The narrative on page 12 was modified to discuss the normal method used in controlling brush.

- (12) Comment: The Department recommended that the first paragraph following table on page 14 be cross referenced to the project map.

Response: The first paragraph following table on page 14 has been cross referenced with the project map as suggested.

- (13) Comment: The Department made the following statement on the Environmental Impact section: "This section would be improved by providing some quantification to impacts. For example, some estimate of the reduction in stream sediment load in tons per unit of time, the estimated acres or miles of increased fishery habitat, water quality improvements in the Paluxy and Brazos Rivers are some of the beneficial effects to be identified."

Response: Every attempt has been made to quantify environmental impacts where data is available. In many cases, reliable data is not available to actually quantify the impacts. The reduction in sediment load is quantified on page 19. The discussion on page 21 has been expanded to show that 904 acres of lake fishery habitat will be created by water impounded in the sediment pools of the structures. The narrative on page 20 addresses itself to the impacts on water quality caused by the project.



- (14) Comment: The Department stated that the impact section appears to contain some duplicative discussions on project impacts when discussing flood control and land use.

Response: A review of the environmental statement did not indicate any undue duplicative discussions. It must be recognized that some duplication may be necessary in order to fully discuss the impacts of the project action.

- (15) Comment: The Department stated that they believed the Planned Project section of the statement should discuss the water supply delivery system for the City of Glen Rose, and that this section should then assess the beneficial and adverse effects of the service and the delivery system.

Response: The statement was revised to include a discussion of the planned delivery system.

- (16) Comment: The Department stated that an assessment of the impacts of providing 442 acre-feet of water for irrigation should be made, especially as it relates to changes in surface or ground water quality as a result of return flows.

Response: The work plan and environmental statement point out that the 442 acre-feet of water is for supplemental irrigation on 550 acres of improved pasture. Irrigation will be with sprinkler system on already established pastureland. The impacts on watershed runoff are included with the total effects of the project in the Environmental Impact section. The effects of increased use of fertilizer has been included in the Environmental Impact section of the environmental statement and Effects of Works of Improvement section of the work plan.

- (17) Comment: The Department stated that the impact of all project features on the aesthetics of the area is contained in two sentences; that a more detailed evaluation appears warranted as to impacts that stem from land use changes, scenic intrusion, or any other factors that would alter the pre-project environmental setting.

Response: The description of the impacts of the structural measures upon the aesthetics is considered adequate. Historic observations of completed projects, which

are similar to that proposed, have not surfaced any evidence that project features significantly detract from the pre-project environmental setting. Therefore, expenditure of additional time is not considered warranted.

- (18) Comment: The Department stated that the Environmental Impact section could also assess the impact of floodwater breaching an upstream structure and the subsequent impact of the breach on downstream structures; that the potential of such an event happening, its frequency, and impacts would add to the quality of this statement.

Response: We do not consider the environmental impact statement the proper place to discuss the potential of a breach of a structure. All practical precautions are taken in the planning, design, and construction of a structure to prevent a failure. It would be conjecture to attempt to predict the frequency of an embankment breach.

- (19) Comment: The Department stated that the Alternatives section does not provide a full assessment of environmental impacts relating to the alternative proposals. The Department stated that: "Evaluation seems to be measured in terms of achieving or foregoing the beneficial effects of the recommended project while a much broader evaluation of environmental effects is warranted. Aspects such as land commitments, vegetation changes, alteration of wildlife habitat, water quality changes, gains or losses in fishery habitat and quality are some of the impacts to be assessed in this section."

Response: A review of the discussion of alternatives indicates that it provided enough information about each alternative so that a decision-maker can judge the relative merits of the alternative after reviewing the impacts of the alternative selected.

- (20) Comment: Concerning the section on short-term uses, long-term productivity, the Department stated: "The discussion in this section of the statement appears to be of questionable value. . . What is lacking is a systematic discussion of short-term social and environmental costs and gains which is balanced against the

long-term social and environmental costs and gains. Cumulative effects of the project and the program on the general environmental setting are not discussed."

Response: It is believed that the discussion presented in this section properly addresses itself to the subject. A review of the discussion indicates that the information suggested to be included in the section is in fact contained in the section. Apparently, it is a matter of opinion as to the value of the discussion.

U. S. Department of Transportation

Comment: The Department had no comment to offer and did not have any objection to the project.

Response: Noted.

Environmental Protection Agency

(1) Comment: The Agency stated: "The combined operations of the 23 single-purpose floodwater retarding structures should be such that flows would be released to the Paluxy River and downstream areas in times of drought or low-flow. Such operations would help maintain and preserve the aquatic life in the river near Glen Rose and deepen permanent pools known to be inhabited by several species of game fish."

Response: An analysis of stream gage records of the Paluxy River at Glen Rose for the period 1948 - 1962 indicates that the stream quit flowing during 1954 for a period of 30 consecutive days, and during 1952 for a period of 4 consecutive days. The only other years when the stream quit flowing for as much as one day were 1951 and 1955. This was during the most severe drought period in recent times.

Due to evaporation losses, there would have been little, if any, water impounded in the sediment pools during this drought period for release downstream. The only way to assure a water supply for augmenting the stream flow would be to store additional water for release during drought years. It does not appear practicable to do so in view of the few times the Paluxy River does not flow. Since the stream flow is a result of spring flow occurring in the central reaches, the structures are not expected to have any adverse impacts on the low flows of the river.



- (2) Comment: The Agency stated: "We appreciate your consideration of Projects of Other Agencies, as discussed on page 14. However, we believe it would be helpful to also include a brief synopsis of other Soil Conservation Service projects in the immediate area (such as the Kickapoo Creek Watershed Project) that might affect or be affected by the works of improvement included in the proposed plan. This information would be helpful in resolving any questions the reviewer might have concerning how other agency projects as well as Soil Conservation Service Projects within the watershed may inter-relate and affect each other from an accumulative standpoint."

Response: The inter-relationship of other Soil Conservation Service projects are discussed in the environmental statement under item 6, Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity.

- (3) Comment: The Agency stated that they were generally in agreement with the Bureau of Sport Fisheries and Wildlife recommendation to fence the sediment pools of the floodwater retarding structures to control pollution from livestock. The Agency stated that: "Unconfined livestock are often a direct source of pollution to open surface waters. Fecal coliforms, other pathogenic bacteria, parasites and viruses are commonly excreted in the feces of livestock and might enter the floodwater-retarding structures in the watershed, the Paluxy River, and eventually the Brazos River. Also, to prevent any direct fecal contamination to the multipurpose structure for water supply in Glen Rose, we suggest that the movement of livestock be controlled (possibly by fencing) to prevent contamination of these waters."

Response: The Bureau of Sport Fisheries and Wildlife recommendation is as follows: "The sediment pool of the floodwater retarding reservoirs be fenced, when practicable, and livestock water requirements be supplied by providing water lanes to the pools." The work plan, on pages 16 and 17, discusses the matter as follows: "The recommendation that the sediment pool of floodwater retarding reservoirs be fenced, when practicable, and livestock water requirements be supplied by providing water lanes to the pools, was considered not feasible. Concentrating livestock into lanes down the slope to

sediment pools causes bare trails to develop and accelerates erosion. Several lanes would be needed to each pool because of multiple ownership of land or divisions of grazing areas around sediment pools. Since the sediment pools are located mainly in rangeland and cropland areas, livestock numbers will be relatively low. The sponsors feel livestock will not be watering in sufficient numbers to cause a significant pollution problem nor detract materially from the fish and wildlife benefits to be derived from the pool areas of floodwater retarding structures. Therefore, action to implement this recommendation is not considered warranted."

It should be noted that the BSWF recommendation would not prevent livestock using the pools for watering. Using water lanes would only concentrate livestock at a few points around the pool. Also, the recommendation would not prevent the same type of pollution from sources such as wildlife. Based on experience at similar structures in nearby watersheds, it is not anticipated that any significant health or water quality problems will arise at any of the pools. However, the plan has been modified to indicate that the sponsoring local organizations will monitor each structure to assure that water pollution does not become a problem. The sponsors have the authority to take remedial action if pollution becomes a fact.

- (4) Comment: The Agency suggested that the location of the 204 ponds to be installed to provide fish habitat and water for wildlife and livestock be identified on the project map (Appendix C). The Agency also suggested that additional information be included to discuss the details of installing these ponds and evaluate the environmental impacts from construction operations.

Response: The location of the ponds is not known at this time. The ponds will be installed as a part of the conservation land treatment program by landowners and operators. Technical assistance will be provided by the Soil Conservation Service through the soil and water conservation districts in working with landowners and operators in developing conservation plans for their land and in carrying out the plans. The land user makes the final decision on what measures will be included and their location. Therefore, a true evaluation of the environmental impacts from construction

operations is impossible. It should be recognized that these ponds are small and normally located in pastureland or rangeland. Although the type of impacts arising from construction operations would be similar, the magnitude of any adverse impact would be very small.

- (5) Comment: The Agency stated: "Although borrow materials for the construction of embankments for the floodwater-retarding structures were classified by soil types, borrow areas should be identified and described, including what precautions and protective measures will be utilized in controlling any erosion that might occur in these areas."

Response: A statement discussing the preliminary location of the sources of borrow material has been included in the plan and environmental statement. The final locations will be determined during the operation stage when detailed geologic investigations are made. The precautions for preventing erosion are contained in the environmental statement.

- (6) Comment: The Agency stated: "The estimated schedule of obligations for the construction of the floodwater-retarding structures for the 8-year installation period (discussed on page 34 of the Work Plan) should be contained in the Final Environmental Impact Statement. A description of the order of construction for these structures would be helpful in assessing the anticipated environmental effects that will be generated during the individual completion of the floodwater-retarding and multipurpose structures."

Response: The planned schedule of construction has been included in the final statement.

- (7) Comment: The Agency stated: "In discussing the environmental impacts of the project, it was mentioned on page 22 that, 'Economic impacts on the local area resulting from the project will include additional requirements of fertilizer.' More information evaluating the potential secondary environmental impacts on the water quality of the Paluxy River and its tributary creeks, the multipurpose structure for water supply, and eventually the Brazos River, from the runoff of increased concentrations of fertilizer residues should be considered in the section, Environmental Impacts."



Response: The potential secondary environmental impacts on water quality of the Paluxy River have been summarized in the work plan under Effects of Works of Improvement and in the environmental statement under Environmental Impact.

- (8) Comment: The Agency stated: "The no-action alternative (Alternative No. 5) was discussed only from the standpoint of the beneficial environmental impacts that would be foregone if the plan were not implemented. Equal consideration should be given to discussing the environmental consequences that might be foregone if the no-action alternative were selected as the final plan of action."

Response: The no-action alternative (alternative No. 5) was revised to include the environmental consequences which would be foregone if a no-action alternative were selected as the final plan of action.

Division of Planning Coordination (State agency designated by Governor and state clearinghouse)

- (1) Comment: The Texas Historical Commission recommended that an intensive archeological survey of the total project area be conducted to locate, record, identify, and appraise the significance of the resource to be affected; this survey to provide and result in definition of research problems, costs, and strategy for further study leading to the mitigation of adverse effects on the resources.

Response: This recommendation has been implemented. A contract was negotiated with S. Alan Skinner, Director, Archeology Research Program, Southern Methodist University, to make the needed archeological study. Results of this study were incorporated into the final statement and work plan. It was agreed with Alton Briggs, research archeologist with the Texas Historical Commission, that a survey of the area involved in each of the sites for the floodwater retarding and multiple-purpose structures would be sufficient.

- (2) Comment: The Texas Water Development Board stated that they believed the indicated 363,000 gpd municipal supply for Glen Rose is excessive for both the present and projected population; also that while reservoir site No. 26 is discussed as the source of municipal water

supply, no mention is made of permits from the Texas Water Rights Commission for the construction of the reservoir, or use of water for that purpose.

Response: The environmental statement points out on page 11 that the consulting engineer employed by the city projected the population and water requirements of Glen Rose. Page 21 presents data concerning the yield of the reservoir. The Service has no basis to question the projection of the city's future population and water needs which were made by a professional engineer registered to practice engineering in Texas.

Page 17 (1st paragraph) states: "All applicable state water laws will be complied with in the design and construction of the structural measures, as well as those pertaining to storage, maintenance of quality, and use of water." This means that the sponsors will comply with the state law which requires a permit to construct a dam with capacity to initially store more than 200 acre-feet and/or to use surface water for municipal, industrial, or irrigation purposes, etc. It is felt that this is clear enough and does not require any changes. The sponsors have not attempted to apply for a permit at this time since the plan has not been approved by the Committees of Congress and it will be several years before construction can be anticipated. The sponsors recognize that the plan might have to be revised if water rights cannot be obtained.

(3) Comment: The Texas Water Development Board stated that there is no mention of the permits for irrigation water nor the intended point of use.

Response: It is felt that the statement quoted in response to comment No. 2 adequately explains that all applicable state laws will be complied with pertaining to the storage and use of water.

The narrative on page 20 was revised to state that the land to be irrigated is in the immediate vicinity of multiple-purpose structures No. 16 and No. 17.

(4) Comment: The Texas Water Development Board stated that they "would question the advisability of changing 235 acres of channel in this particular project, and of clearing vegetation from an additional 1,263 acres."

Response: The impacts of changing the 235 acres of channel in the project and of clearing the vegetation from 1,263 acres of additional land are discussed in the statement. The statement points out that the channels will be changed to water areas and the changes will be generally beneficial to fish and wildlife. The statement also points out that 359 acres of the 1,263 will be revegetated with multi-use plants during project installation. The remaining 904 acres will be used for the storage of sediment and water. These changes are considered unavoidable if the project is to be installed.

- (5) Comment: The Texas Water Rights Commission reiterated their specific suggestions concerning permits and water rights.

Response: As pointed out, this is a reiteration of specific suggestions which the Texas Water Rights Commission previously furnished. The sponsoring local organizations and the Service are well aware of the state statutes regarding the storage and use of surface water. The plan clearly states that it is the intent of the sponsoring local organizations and the Service to fully comply with all applicable state laws.

- (6) Comment: The Texas Water Quality Board recommended that the proposed operation and maintenance agreement with project sponsors include specific recommendations for the surveillance of those structures where livestock watering might pose a pollution hazard.

Response: The first paragraph on page 17 of the statement states that all applicable state laws will be complied with in the design and construction of the structural measures, as well as those pertaining to storage, maintenance of quality, and use of water.

The operation and maintenance agreement will include specific recommendations for the monitoring of the structures where pollution may pose a hazard.



9. List of Appendixes

Appendix A - Comparison of Benefits and Costs for Structural Measures

Appendix B - Letters of Comment Received on the Draft Environmental Statement

Appendix C - Project Map

APPROVED BY Kenneth Elliott DATE MAY 17 1974  
Administrator



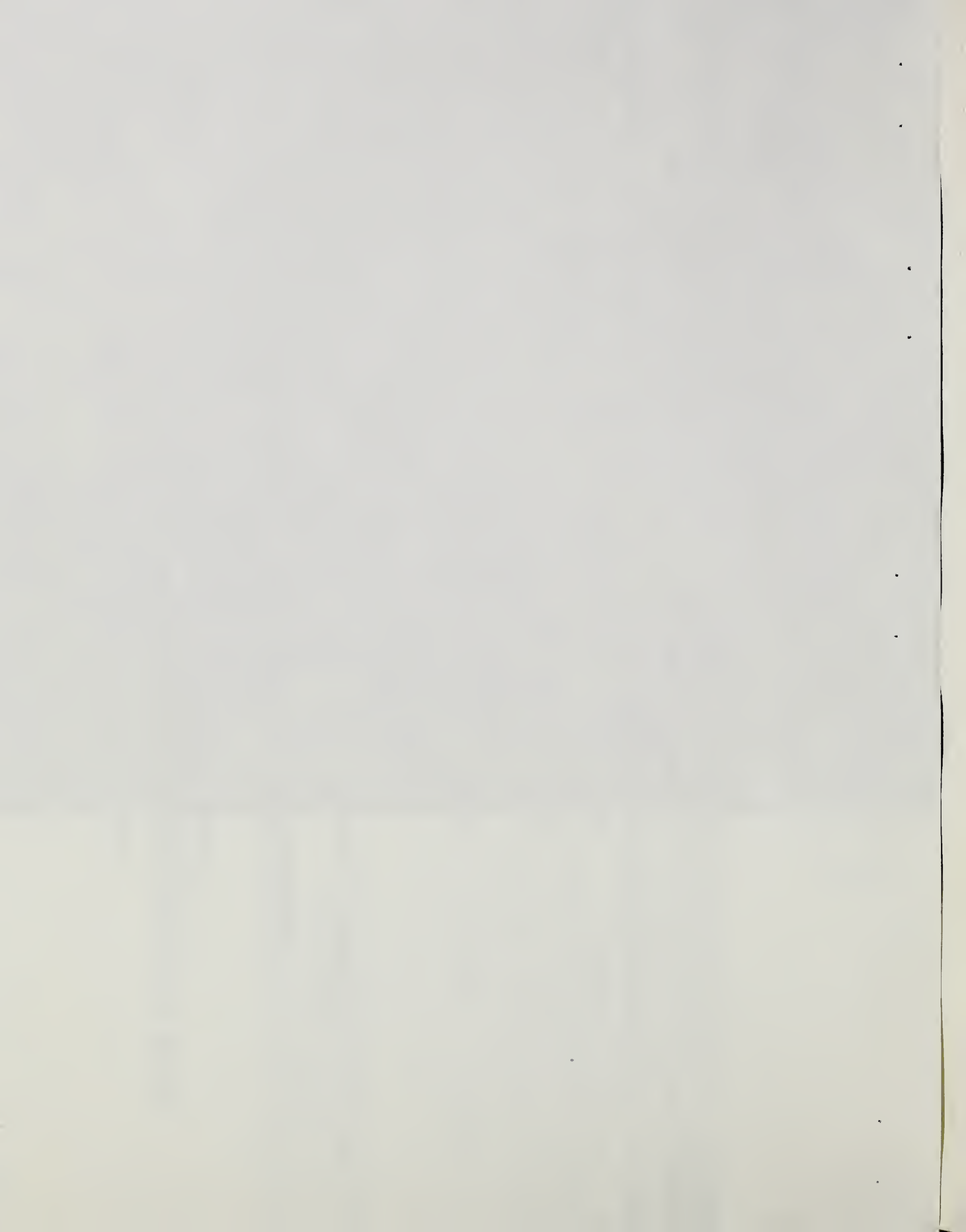
APPENDIX A

COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES  
 Paluxy River Watershed, Texas  
 (Dollars)

	AVERAGE ANNUAL BENEFITS <sup>1/</sup>										Average Annual Cost <sup>2/</sup>	Benefit- Cost Ratio
	Damage Reduction	More Intensive Land Use	Incidental Recreation	Irrigation	Municipal Water Supply	Secondary	Total	xxx	xxx	xxx		
23 Floodwater Retarding Structures and 3 Multiple-Purpose Struc- tures	317,950	13,570	7,100	6,041	11,190	71,700	427,551	225,554	1.9:1.			
Project Administration	xxx	xxxx	xxx	xxx	xxx	xxxx	xxx	31,101	xx			
GRAND TOTAL <sup>3/</sup>	317,950	13,570	7,100	6,041	11,190	71,700	427,551	256,655	<sup>3/</sup> 1.7:1.			

1/ Price Base: Adjusted normalized prices (April 1966) for agricultural benefits and 1970 prices for non-agricultural benefits.  
 2/ Installation - 1972 prices amortized for 100 years at 5.5 percent interest; operation and maintenance at 1972 prices.  
 3/ In addition, it is estimated that land treatment measures will provide \$10,221 damage reduction benefits in the benefited area.







DEPARTMENT OF THE ARMY

OFFICE OF THE UNDER SECRETARY

WASHINGTON, D.C. 20310

Honorable Robert W. Long  
Assistant Secretary of Agriculture  
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83rd Congress, the Administrator of the Soil Conservation Service, by letter dated 11 April 1973, requested comments on the Watershed Work Plan and Draft Environmental Statement for the Paluxy River Watershed, Texas.

We have reviewed the work plan and foresee no conflict with any projects or current proposals of this Department. The draft environmental statement is also satisfactory to this Department.

Sincerely,

Charles R. Ford  
Acting Special Assistant to the  
Secretary of the Army (Civil Functions)

SOIL CONSERVATION SERVICE  
WASHINGTON, D.C. 20310

1973 JUN 17 09 54 AM

RECEIVED FROM







DEPARTMENT OF HEALTH, EDUCATION AND WELFARE  
 REGIONAL OFFICE  
 1114 COMMERCE STREET  
 DALLAS, TEXAS 75202

OFFICE OF  
 THE REGIONAL DIRECTOR

Our Reference: EI # 0573-243

RECEIVED  
 1973 JUL 12 PM 1:00  
 SOIL CONSERVATION SERVICE  
 WASHINGTON, D.C.

Mr. Kenneth E. Grant  
 Administrator  
 United States Dept. of Agriculture

Re: Paluxy River Watershed  
 Erath, Hood, and Somervell  
 Counties, Texas

Dear Mr. Grant

Pursuant to your request, we have reviewed the Environmental Impact Statement for the above project proposal in accordance with Section 102(2)(C) of P. L. 91-190, and the Council on Environmental Quality Guidelines of April 23, 1971.

Environmental health program responsibilities and standards of the Department of Health, Education, and Welfare include those vested with the United States Public Health Service and the Facilities Engineering and Construction Agency. The U. S. Public Health Service has those programs of the Federal Food and Drug Administration, which include the National Institute of Occupational Safety and Health and the Bureau of Community Environmental Management (housing, injury control, recreational health and insect and rodent control).

Accordingly, our review of the Draft Environmental Statement for the project discerns no adverse health effects that might be of significance where our program responsibilities and standards pertain, provided that appropriate guides are followed in concert with State, County, and local environmental health laws and regulations.

We therefore have no objection to the authorization of this project insofar as our interests and responsibilities are concerned.

Very truly yours,

William F. Crawford  
 Environmental Impact Coordinator



DEPARTMENT OF THE ARMY  
OFFICE OF THE UNDER SECRETARY  
WASHINGTON, D.C. 20310

Honorable Robert W. Long  
Assistant Secretary of Agriculture  
Washington, D. C. 20250

Dear Mr. Long:

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We have reviewed the work plan and foresee no conflict with any projects or current proposals of this Department. The draft environmental statement is also satisfactory to this Department.

Sincerely,

A handwritten signature in cursive script that reads "Charles R. Ford".

Charles R. Ford  
Acting Special Assistant to the  
Secretary of the Army (Civil Functions)

SOIL CONSERVATION SERVICE  
WASHINGTON, D.C.

1973 JUL 17 PM 5:11

RECEIVED MAIL ROOM



# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

ER-73/569

JUL 13 1973

RECEIVED  
1973 JUL 17  
SOIL CONSERVATION  
WASHINGTON, D.C.

Dear Mr. Grant:

This is in reply to your letter of April 11, 1973, requesting our views and comments on a work plan and draft environmental statement for the Paluxy River Watershed, Erath, Hood, and Somervell Counties, Texas.

The proposed project will not adversely affect any existing, proposed or known potential units of the National Park System nor any historic, natural, or environmental education sites eligible or considered potentially eligible for the National Landmark Program. We also find that the project will not impact on the program of our Bureau of Reclamation.

For project compliance with the Federal Reservoir Salvage Act (P.L. 86-523), we request that the Director, Southwest Region, National Park Service, Post Office Box 728, Santa Fe, New Mexico 87501, be kept informed of the progress of this proposal so that any necessary archeological work appropriate to the post-authorization phase can be programmed for completion prior to the start of project construction. Should parties to the work plan agreement desire to initiate early action in response to the Federal Reservoir Salvage Act, the National Park Service can assist them in arranging for any needed archeological work to be undertaken by a cooperating institution on a reimbursable basis.

Although stone, sand and gravel, natural gas, and petroleum are known to occur in sections of the three-county area of which this watershed is a part, no mineral resources or operations are known to exist within areas proposed to be inundated by the 26 structures. Insofar as can be determined without an onsite examination, the project as planned would have no adverse effect upon the mineral resource base or mineral developments in the immediate or surrounding areas. Therefore, we have no revisions to suggest either in the work plan or draft environmental statement.



We believe this project could have beneficial effects on fish and wildlife if the recommendations in the Bureau of Sport Fisheries & Wildlife's report of April 14, 1969, are implemented. We note, however, that landowners are to be encouraged to carry out the measures for protecting fish and wildlife rather than obligated to protect these resources. We believe the Soil Conservation Service should take a more positive stand on the protection of fish and wildlife resources and recommend that as a condition of project authorization, non-Federal interests be required to implement the fish and wildlife protection measures insofar as it is consistent with the provisions of Public Law 566.

The basis for our recommending that non-Federal implementation of plans to protect fish and wildlife be mandatory is that in accordance with your guidelines, protection of fish and wildlife is already encouraged. However, in discussing alternative 5 in the draft statement, it points out that due to grazing pressure, brush clearing is expected to continue at an accelerated rate in the absence of the project. Hence, much of the virgin ashe juniper thicket, at the south edge of the watershed, would be indiscriminately cleared, thereby eliminating or reducing nesting habitat for the golden-cheeked warbler. If this foregoing assessment is reasonably accurate, there is a valid basis for questioning the success of programs which are based on encouraging implementation by the agricultural interests.

Based on the information in the work plan and draft statement, we do not arrive at the same conclusion that land treatment measures will preserve and improve wildlife resources. The composition of the land treatment relates to 9,380 acres of cropland and 45,899 acres of grassland. Both the statement and the work plan explain that treatment to improve grassland will reduce food resources for dove and quail over the long term. Because deer are primarily browsers, the statement on reduced food resources also applies to them. We suggest that a more detailed discussion on the specifics of land treatment and the beneficial effects on wildlife would provide the necessary support to your funding that land treatment will preserve and improve wildlife resources.

We also wish to propose a correction in the second paragraph on page 8 of the work plan and in the last paragraph on page 6 of the environmental statement to reflect a recent change. The second sentence in each paragraph should read, "It is listed as threatened by the Bureau of Sport Fisheries and Wildlife in their Resource Publication 114, Threatened Wildlife of the United States, dated March 1973."

We also request that the enclosed report of the Bureau of Sport Fisheries and Wildlife accompany the work plan when it is forwarded to Congress.

We have reviewed the draft statement and submit the following comments for your consideration and use in preparing the final environmental statement for this project.

#### Summary - Item VII

We believe that interest groups, such as the National Wildlife Federation, the Sierra Club, Audubon Society, etc., might also provide some valuable insights on this proposal and suggest you consider their inclusion in the group selected to review your draft statement.

#### Environmental Setting - Page 7, Paragraph 3

We are pleased to note that it has been determined that no properties listed in the National Register of Historic Places will be affected by the project, and that it has been further determined that no properties now known to be eligible for nomination to the National Register will be affected. We trust that the Texas State Historic Preservation Officer was consulted in making these determinations. If not, we suggest he be asked to comment on the relation between the proposal and cultural (historic, archeological, architectural) resources--particularly those he may deem eligible for nomination to the National Register.

We also wish to commend the conduct of a preliminary archeological reconnaissance of areas affected by the project. However, it is evident from the environmental statement and

work plan that a greater degree of interdisciplinary investigation will be necessary to adequately identify the area's cultural resources, assess expected environmental effects, and develop mitigating measures and alternatives with lesser effects upon cultural values. We trust that the stated adherence to the provisions of the Reservoir Salvage Act will go far toward meeting this need; but at the present time, we believe the discussion of cultural resources in the subject document is insufficient for environmental statement purposes. A qualified professional archeologist should survey all lands to be disturbed by proposed structural and conservation measures and areas to be cleared in connection with construction activities. The resultant report should examine the significance of such resources in the project area and include estimates of costs required to mitigate any adverse effects anticipated. The report should be cited in the final statement and be available for review.

Finally, we commend the evident concern for the protection of the paleontological resources of Dinosaur Valley State Park.

#### Page 12, Last Paragraph

This paragraph should be expanded to discuss how much invading brush control is to be controlled and what methods of control will be used.

#### Page 13, Last Paragraph

We suggest that this paragraph provide some cross-referencing with the project map as to the project features being discussed. This will provide the reader with a better appreciation of the proposed project.

#### Environmental Impacts

This section would be improved by providing some quantification to impacts. For example, some estimate of the reduction in stream sediment load in tons per unit of time, the estimated acres or miles of increased fishery habitat,



water quality improvements in the Paluxy and Brazos Rivers are some of the beneficial effects to be identified.

The impact section appears to contain some duplicative discussions on project impacts when discussing flood control and land use. For example, flood control accomplishments are discussed in terms of acreage protected, frequency of flooding and magnitude of floods. Such repetition takes away from the quality of the statement.

We believe the "planned project" section of the statement should discuss the water supply delivery system for the City of Glen Rose. This section should then assess the beneficial and adverse effects of the service and the delivery system.

The project also provides an allocation of 442AF of water for irrigation. This section should assess the impacts of providing irrigation service on the environment, especially as it relates to changes in surface or groundwater quality as a result of return flows.

The impact of all project features on the aesthetics of the area is contained in two sentences. A more detailed evaluation appears warranted as to impacts that stem from land use changes, scenic intrusion, or any other factors that would alter the pre-project environmental setting.

The section could also assess the impact of floodwater breaching an upstream structure and the subsequent impact of the breach on downstream structures. The potential of such an event happening, its frequency and impacts would add to the quality of this statement.

### Alternatives

This section does not provide a full assessment of environmental impacts relating to the alternative proposals. Evaluation seems to be measured in terms of achieving or foregoing the beneficial effects of the recommended project while a much broader evaluation of environmental effects is warranted. Aspects such as land commitments, vegetation changes, alteration of wildlife habitat, water quality changes, gains or losses in fishery habitat and quality are some of the impacts to be assessed in this section.

Short-Term Uses - Long-Term Productivity

The discussion in this section of the statement appears to be of questionable value. It is just a restatement of the nature of this project, a discussion on other adjacent projects and an uncoordinated identification of various impacts and benefits. What is lacking is a systematic discussion of short-term social and environmental costs and gains which is balanced against the long-term social and environmental costs and gains. Cumulative effects of the project and the program on the general environmental setting are not discussed.

We trust the foregoing comments will be of assistance in finalizing your report for the Congress.

Sincerely yours,

Assistant

  
Secretary of the Interior

Mr. Kenneth E. Grant  
Administrator  
U.S. Department of Agriculture  
Soil Conservation Service  
Washington, D. C. 20250



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF SPORT FISHERIES AND WILDLIFE

POST OFFICE BOX 1306  
ALBUQUERQUE, NEW MEXICO 87103

April 14, 1969

Mr. H. N. Smith, State Conservationist  
Soil Conservation Service  
Post Office Box 648  
Temple, Texas 76501

Dear Mr. Smith:

The Bureau of Sport Fisheries and Wildlife in cooperation with the Texas Parks and Wildlife Department has completed a reconnaissance of the Paluxy River Watershed in Erath, Hood, and Somervell Counties, Texas. The project is sponsored by the Paluxy Watershed Association, the Hood-Parker Soil and Water Conservation District, the Bosque Soil and Water Conservation District, and the County Commissioners Courts of Erath, Hood, and Somervell Counties, in cooperation with your Service under the authority of the Watershed Protection and Flood Prevention Act (68 Stat. 666, as amended; 16 U.S.C. 1008).

This report was prepared in accordance with the provisions of Section 12 of the above Act. It has the concurrence of the Texas Parks and Wildlife Department as indicated by the enclosed copy of a letter dated March 7, 1969, signed by Executive Director J. R. Singleton.

This project includes approximately 249,000 acres, about 80 percent of the entire Paluxy River Watershed. The river heads about 10 miles north of Stephenville in Erath County and flows southeastward across the eastern part of that county, the southeastern portion of Hood County, and the northwestern part of Somervell County. The city of Glen Rose lies three miles downstream from the lower project boundary and about two miles upstream from the confluence of the Paluxy and Brazos Rivers.

Approximately 93 percent of the project area is upland and 7 percent is floodplain. The topography of the watershed ranges from rolling and steeply rolling land in most of the upland area to gently sloping valleys and terraces along the streams. Elevations vary from about 650 feet above mean sea level in the valley at the



lower end to about 1,500 feet at the headwaters of the watershed. The Paluxy River is the principal stream in the project area. There are six major tributaries and numerous smaller tributaries within the project boundary. The streams in the watershed, except the Paluxy River and short spring-fed reaches of some tributaries, are intermittent.

The Grand Prairie Land Resource Area makes up 75 percent of the project area. The soils are stony calcareous clays and clay loams. The ground vegetation is needlegrass, sideoats grama, bluestem, Indiangrass, broomweed, greenbriar, and wild grape. The overstory, found mainly along the streamcourses, is composed of pecan, elm, and some walnut. Eighty-five percent of this Land Resource Area is in range, 11 percent is in crops, 3 percent is in pasture, and 1 percent is in miscellaneous uses. The crops grown are grain sorghum, hay, oats, and peanuts. The pastures and rangelands are grazed primarily by cattle.

The Cross Timbers Land Resource Area makes up the balance of the project land and is found mainly near the watershed divides. The soils consist of fine sandy loams and loamy sands which have developed on soft sandstone bedrocks. The understory vegetation consists in part of hairy grama, silver bluestem, fringleaf paspalum, broomweed, dotted gayfeather, sumac, and greenbriar. The overstory is scattered post oak, blackjack oak, and some live oak. Thickets of Ashe juniper, called cedar brakes locally, are found at the south edge of the watershed. The land use in the Cross Timbers Land Resource Area is about 62 percent range, 17 percent cropland, 19 percent pasture, and 2 percent miscellaneous uses.

The soils of the Cross Timbers Land Resource Area have been damaged severely by past sheet and gully erosion on intensively cultivated lands. Conversion to grassland has reduced drastically upland sheet erosion. However, moderate to high rates of erosion are continuing on severely eroded areas which have not received adequate land treatment. Severe erosion also is a problem on cropland in the floodplain because of scouring. Minor flooding occurs about once every three years and a major flood occurs about every five to seven years.

It is expected that from 20 to 30 floodwater retarding structures would be needed to reduce flooding by 70 percent in the watershed. The structures would be built in the uplands. At the sites the land would be cleared of vegetation to the top of the sediment pool. All of the sediment pools probably would hold water without high losses from seepage.

Substantial land treatment measures have been applied to the watershed. In addition to the maintenance of those measures already applied, it is expected that additional measures will include grassed waterways, cover crops, terracing, range seeding, deferred and proper grazing use, brush control, and farm ponds. During the project installation period it is estimated that about 200 farm ponds would be built.

Fish habitat in the watershed is limited to the Paluxy River, short spring-fed reaches in some tributaries, permanent pools in the intermittent creeks, farm ponds, and four small private reservoirs.

The principal fish species in the watershed are largemouth bass, bluegill, redear and green sunfish, channel and flathead catfish, gizzard shad, carp, smallmouth buffalo, river carpsucker, and the gray redhorse. The only public fishing access to the river in the watershed is at highway crossings. There is some fishing by landowners and their friends on private property. The State of Texas is buying land for a State park along the Paluxy River at the lower end of the project area to preserve the dinosaur tracks found there. Initially, the park will open one mile of the river to public fishing. Later, land acquisition will expand the fishing access to 3.6 river miles.

There is no commercial fishing in the watershed and none is expected to develop without the project.

With the project, the land treatment measures and floodwater retarding structures would reduce the amount of sediment reaching the Brazos River and Whitney Reservoir, thus improving downstream fish habitat. The city of Glen Rose may sponsor the addition of recreation storage to the floodwater retarding structure planned for the Bowden Branch tributary. That reservoir would receive about 2,000 man-days of fishing annually. The town of Morgan Mill probably will sponsor municipal water storage in the floodwater retarding structure planned for Counts Creek and may also sponsor recreation storage there.

No commercial fishing is expected to develop with the project.

Important game animals in the watershed are white-tailed deer, bobwhite, and mourning dove. Other wildlife species present include fox squirrel, cottontail, opossum, raccoon, gray fox, bobcat, coyote, ring-tailed cat, and skunk. Low numbers of waterfowl are found in the project area during spring and fall migration.

The golden-cheeked warbler occurs in the watershed. It is listed by the Bureau of Sport Fisheries and Wildlife as a rare species in their Resource Publication 34, Rare and Endangered Fish and Wildlife of the United States, dated July 1966. That bird requires the bark of virgin Ashe juniper trees for nest material and obtains its food from the juniper-oak association. About 4,000 acres of the virgin Ashe juniper grow at the southern edge of the watershed. Plate I shows the approximate location of the junipers used by golden-cheeked warblers for nest material.

The deer population is low throughout the watershed and hunting for deer is light to moderate. Most deer hunting is done on a lease basis.

Squirrel numbers are moderate along the stream and low elsewhere. These animals receive some hunting. Quail are found in low to moderate numbers in the project area and hunting for them is moderate to heavy. Mourning doves are present in moderate numbers in most of the watershed, and there is much interest in hunting them. Little duck hunting is done in the watershed because of low populations. There is some interest in sport hunting for raccoons, bobcats, foxes, and coyotes. A few raccoons are trapped for their fur.

Without the project, future wildlife densities and the amount of hunting would be expected to increase slightly due to improved game management techniques and increasing hunter demand.

With the project, the structural measures and most land treatment measures generally would aid wildlife. The floodwater retarding reservoirs and farm ponds would provide some resting areas for waterfowl. Flood reduction below the reservoirs would improve reproduction for groundnesting birds. Land treatment measures such as conservation cropping systems, proper range use, and deferred grazing would be beneficial to big game and upland game. Stirring of the soils would stimulate weed growth and thus benefit seed-eating animals. However, increasing the density of grass cover in the project area would not be advantageous to doves and bobwhites. Indiscriminate brush control would be damaging to wildlife habitat in the watershed.

The watershed is in a region of high recreation demand. Within a 75-mile radius of the watershed's center are located the Dallas-Fort Worth metropolitan area and five cities with a population of 15,000 or more people. The demand for recreation from those cities, coupled with the watershed's Dinosaur Tracks State Park and the natural beauty of the basin, could produce large economic returns



from public recreation developments in the watershed. Whitney Reservoir near Meridian, Texas, and DeCordova Bend Reservoir near Granbury, Texas, may compete with the watershed project's recreation potential. However, unsatisfied fishing and hunting demands would be large enough to make the implementation of a project recreation plan a definite asset to the watershed.

There are several ways in which the project plans could be modified to aid fish and wildlife habitats, populations, and harvests.

The floodwater retarding structures near the communities of Glen Rose and Morgan Mill should be expanded to include recreation storage. Also, floodwater retarding reservoirs and farm ponds could be opened to the public for moderately priced fee fishing.

Landowners and the project sponsors should consult the Texas Parks and Wildlife Department regarding the fish stocking requirements of the new waters created by the project. Such consultation would discourage the introduction of undesirable fish species into the project's waters and would insure the best fish stocking rate.

If native grasses or forbs are planted in the basin of the sediment pools prior to inundation, the water fertility would be increased and its turbidity decreased. Vegetation planted on the barren areas draining into the reservoirs also would improve fertility and reduce turbidity.

The control of livestock entering into the area in and around the reservoir sediment pools would reduce fouling of the water and aid the growth of wildlife food and cover plants. When practicable, the sediment pools should be fenced and livestock water requirements supplied by providing water lanes to the pools.

Land treatment measures which would aid wildlife include wildlife habitat development and preservation, field border planting, and hedgerow planting. The deer population on the Cross Timbers Land Resource Area in the watershed is low because of a reduced winter food supply. It could be increased by planting small grain winter crops or legumes, a practice which could be included under the land treatment measures of pasture and hayland planting, range seeding, and conservation cropping systems.

In areas where brush control is done, it should be carried out with wildlife habitat preservation and enhancement in mind. For example, steep easily eroded hillsides should not be cleared. On rolling or flat areas, brush could be controlled by alternating

cleared strips with brushy strips at least 100 yards wide. In addition, wildlife escape corridors of brush could be preserved, and some trees could be half-cut and pushed over. In general, about one-fourth of the area's existing brush should be retained as scattered tracts.

Some areas of particular value to wildlife should receive little or no brush control treatment. It is important that the virgin juniper thickets at the south edge of the watershed be preserved to the maximum extent practicable. However, if landowners must remove some junipers there, the removal should be carried out so as to avoid eliminating the golden-cheeked warbler nesting habitat. A little selective clearing can be done in the virgin juniper thickets, but it should be carried out according to a plan mutually agreed upon by the project sponsors, the Soil Conservation Service, and the Texas Parks and Wildlife Department.

Losses of brush and timber resulting from the installation of project measures could be partly offset by planting shrubs and trees at appropriate locations such as idle lands, eroded areas, streambanks, gullies, along fencerows, and around floodwater retarding reservoirs.

With improved wildlife habitat in the watershed moderately priced lease hunting could be expanded. In addition, progressive landowners could form a hunting and fishing cooperative and urban sportsmen could be sold annual permits entitling them to pursue their sport on lands owned by the cooperative members.

All of the foregoing procedures, if accompanied by an aggressive advertising campaign, will satisfy much of the current and future demand for outdoor recreation in the watershed.

In view of the above, it is recommended that:

1. Landowners seek the advice of the Texas Parks and Wildlife Department in the management and stocking of their reservoirs for fish and the management of those waters for wildlife.
2. Native grasses or forbs be planted on barren areas of the sediment pools and on unvegetated areas draining into the subbasins.

3. The sediment pool of the floodwater retarding reservoirs be fenced, when practicable, and livestock water requirements be supplied by providing water lanes to the pools.
4. The land treatment measures of wildlife habitat development, wildlife habitat preservation, field border planting, and hedgerow planting be included in the watershed work plan.
5. The practice of planting small-grain winter crops or legumes be included under the land treatment measures of pasture and hayland planting, range seeding, and conservation cropping systems, on the Cross Timbers land in the watershed.
6. Brush control be done so as to preserve or enhance wildlife habitat by maintaining the brush on easily eroded hillsides, by alternating cleared strips with brushy strips at least 100 yards wide, by preserving escape corridors of brush for wildlife, by half-cutting some trees, and by retaining about one-fourth of the watershed's existing brush as scattered tracts.
7. Any brush control done in the virgin juniper thickets at the south edge of the watershed, be carried out only according to a management plan mutually agreed upon by the project sponsors, the Soil Conservation Service, and the Texas Parks and Wildlife Department.
8. Losses of woody vegetation due to the building of project structural measures be compensated for by planting trees and shrubs suitable for wildlife at appropriate locations such as idle lands, eroded areas, streambanks, along fencerows, and around reservoirs.
9. Landowners consider the feasibility of forming a hunting and fishing cooperative, whereby members would sell annual hunter and fisherman permits which would allow entrance onto cooperative lands.

The above recommendations are in conformance with the U.S.D.A. Soil Conservation Service Plant Sciences Memorandum-5, National Standards and Guides to Specifications for Conservation Practices

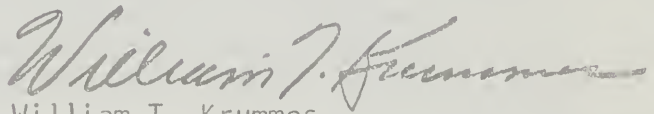


in the Plant Sciences. If adopted as a part of the plan of development, losses of wildlife habitat would be mitigated and, additionally, fish and wildlife benefits would accrue to the project.

We would appreciate being advised of the action taken by the project sponsors relative to implementing the above recommendations.

Thank you for your cooperation in providing project information.

Sincerely yours,



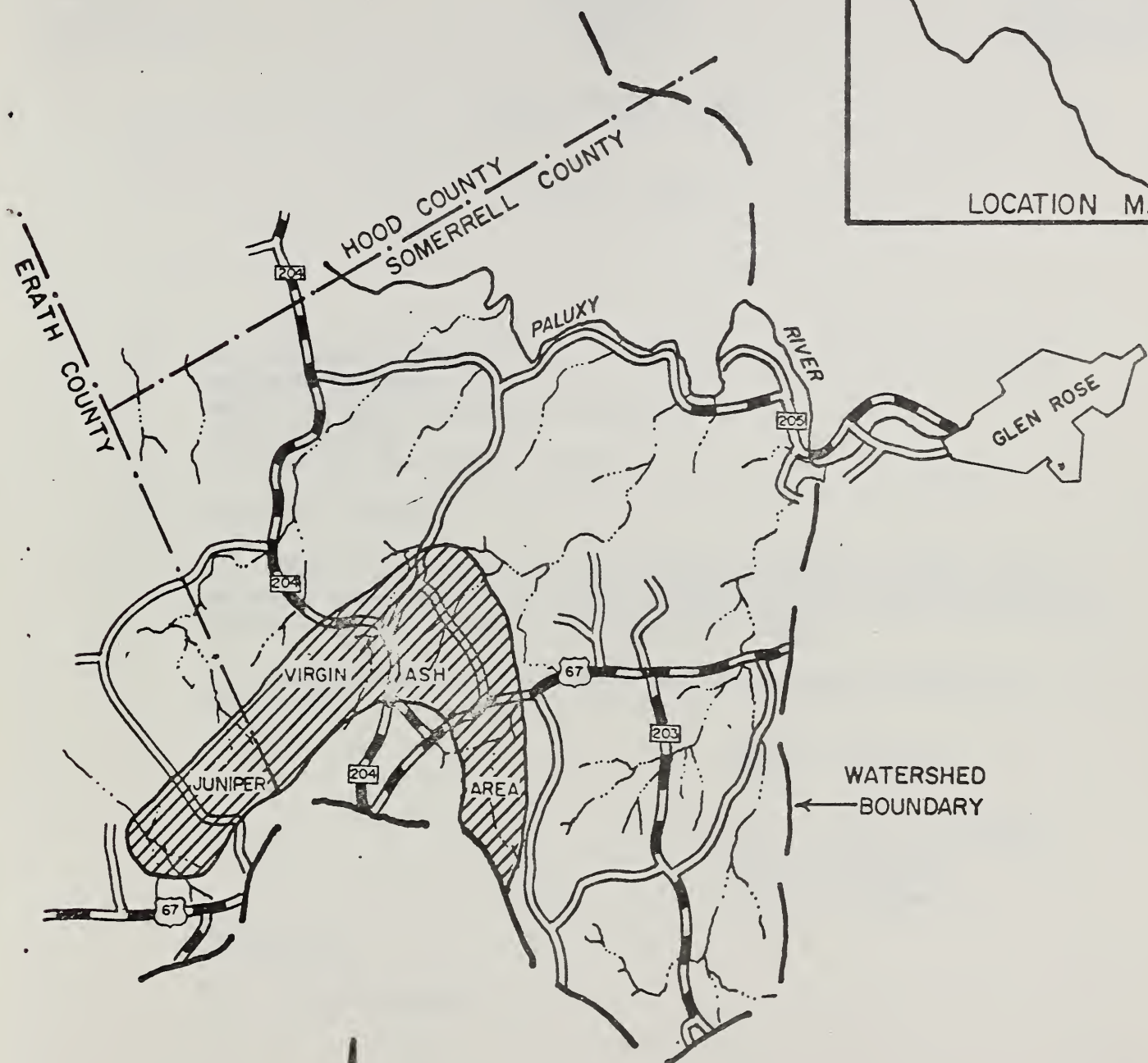
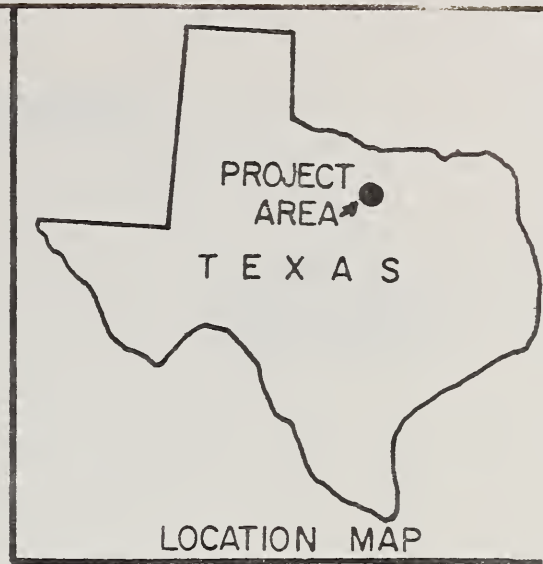
William T. Krummes  
Regional Director

Enclosures 2

Copies (7)

Distribution:

- (5) Executive Director, Tex. Parks and Wild. Dept., Austin, Tex.
- (1) President, Tex. St. S&W. Cons. Bd., Temple, Tex.
- (1) Chairman, Hood-Parker S&W. Cons. Dist., Weatherford, Tex.
- (1) Chairman, Bosque S&W. Cons. Dist., Clifton, Tex.
- (1) Judge, Erath County Comm. Court, Stephenville, Tex.
- (1) Judge, Hood County Comm. Court, Granbury, Tex.
- (1) Judge, Somervell County Comm. Court, Glen Rose, Tex.
- (1) Chairman, Paluxy Watershed Assn., Stephenville, Tex.
- (1) Department of Biology, University of Dallas, Irving, Tex.
- (1) Regional Coordinator, USDI, SW Region, Muskogee, Okla.
- (2) Regional Director, FWPCA, So. Cent. Reg., Dallas, Tex.
- (2) Regional Director, BOR, Mid-Continent Reg., Denver, Colo.
- (1) Regional Biologist, SCS, Fort Worth, Tex.
- (2) Field Supervisor, BSW, Div. of River Basin Studies, Ft. Worth, Tex.



SCALE IN MILES

UNITED STATES DEPARTMENT OF THE INTERIOR  
 FISH AND WILDLIFE SERVICE  
 BUREAU OF SPORT FISHERIES AND WILDLIFE

SOUTHERN PORTION OF  
 PALUXY RIVER WATERSHED, TEXAS  
 SHOWING APPROXIMATE LOCATION  
 OF VIRGIN ASH JUNIPER AREA

---

ALBUQUERQUE, NEW MEXICO REGION

---

DATE: FEBRUARY 1969 PLATE I





TEXAS  
PARKS AND WILDLIFE DEPARTMENT

COMMISSIONERS

L. P. GILVIN  
CHAIRMAN, AMARILLO  
JAMES M. DELLINGER  
MEMBER, CORPUS CHRISTI  
HARRY JERSIG  
MEMBER, SAN ANTONIO



J. R. SINGLETON  
EXECUTIVE DIRECTOR  
ROBERT G. MAUERMANN  
DEPUTY DIRECTOR

JOHN H. REAGAN BUILDING  
AUSTIN, TEXAS 78701

March 7, 1969

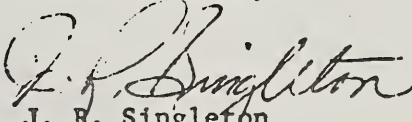
Mr. William T. Krummes  
Regional Director  
Bureau of Sport Fisheries & Wildlife  
P. O. Box 1306  
Albuquerque, New Mexico 87103

Dear Mr. Krummes:

This is in response to your letter of March 4, 1969, and the attached review draft of a report concerning the Soil Conservation Service proposed Paluxy River Watershed, Texas.

We have reviewed this draft and concur with the report as presented.

Yours sincerely,

  
J. R. Singleton  
Executive Director

JRS:KCJ:jw

cc: Mr. John Degani





DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD

MAILING ADDRESS:  
U.S. COAST GUARD (GWS/83)  
409 SEVENTH STREET SW.  
WASHINGTON, D.C. 20590  
PHONE: 202 426-2262

• 1 JUN 1973

- Mr. Kenneth E. Grant  
Administrator, Soil Conservation  
Service  
Washington, D. C. 20250

Dear Mr. Grant:

This is in response to your letter dated 11 April 1973 addressed to Admiral Bender concerning the draft environmental impact statement for the Paluxy River Watershed, Earth, Hood and Somervell Counties, Texas.

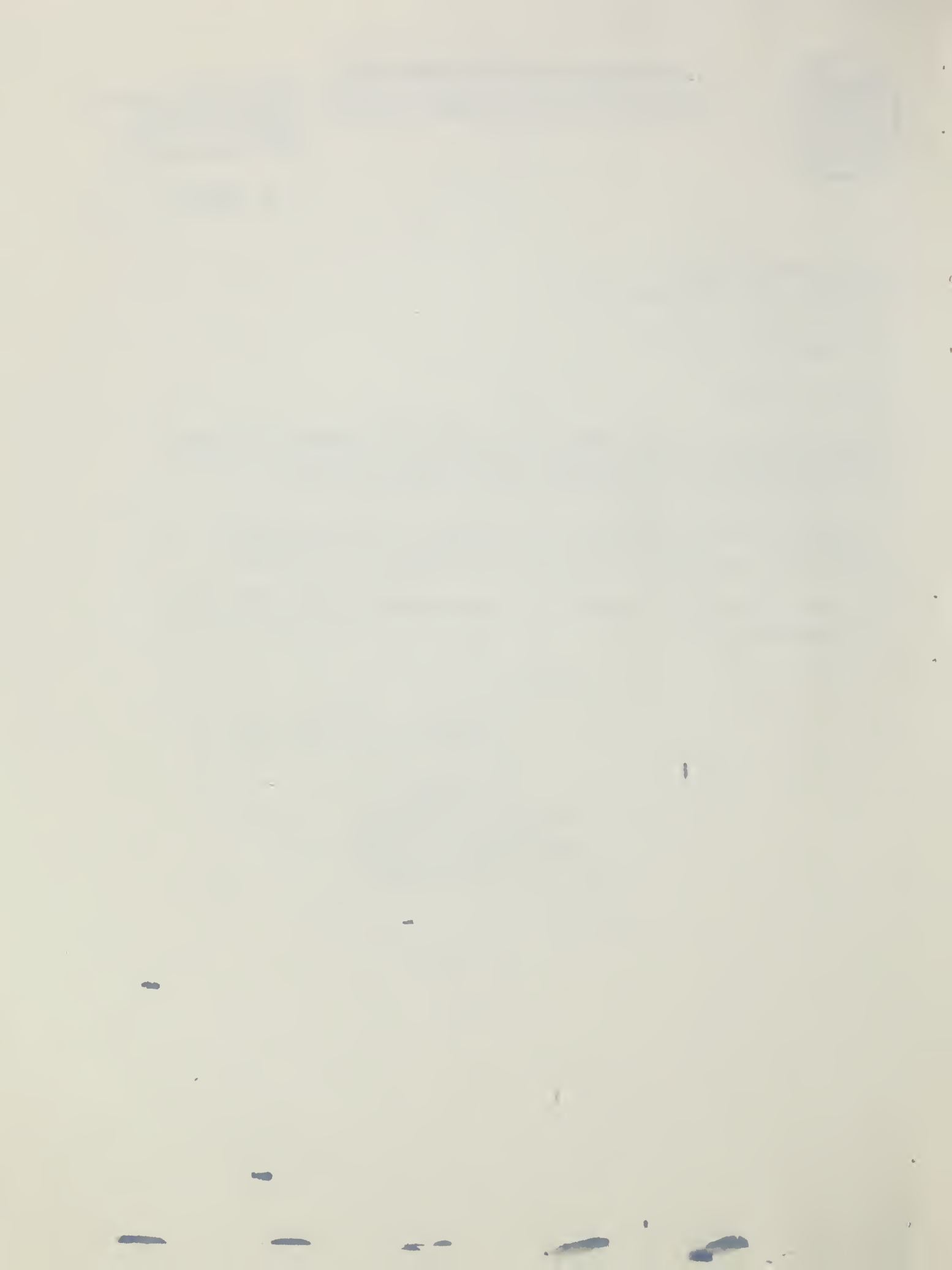
The Department of Transportation has reviewed the material submitted. We have no comment to offer nor do we have any objection to the project.

The opportunity for the Department of Transportation to review this project is appreciated.

Sincerely,

J. D. MCCAIN  
Captain, U. S. Coast Guard  
Acting Chief, Office of Marine  
Environment and Systems





RECEIVED MAIL ROOM  
ENVIRONMENTAL PROTECTION AGENCY  
1973 JUN -7 PM 3:30 REGION VI  
1600 PATTERSON, SUITE 1100  
SOIL CONSERVATION SERVICE DALLAS, TEXAS 75201  
WASHINGTON, D.C.

June 4, 1973

OFFICE OF THE  
REGIONAL ADMINISTRATOR

Mr. Kenneth E. Grant  
Administrator  
Soil Conservation Service  
U. S. Department of Agriculture  
Washington, D. C. 20250

Re: 06-3-120-TX

Dear Mr. Grant:

We have reviewed the Draft Environmental Impact Statement, Paluxy River Watershed Project, Erath, Hood, and Somervell Counties, Texas, and the Work Plan for Watershed Protection, Flood Prevention, and Agricultural and Non-Agricultural Water Management, Paluxy River Watershed. The proposal consists of land treatment measures to be applied to about 55,279 acres of grassland and cropland, and 23 floodwater-retarding structures and 3 multipurpose structures to be installed during an 8-year period.

In general, the information contained in the Work Plan was comprehensive and adequately covered the details of the proposed project. However, the following comments should be considered in finalizing the plan:

1. The combined operations of the 23 single-purpose floodwater-retarding structures should be such that flows would be released to the Paluxy River and downstream areas in times of drought or low-flow. Such operations would help maintain and preserve the aquatic life in the river near Glen Rose and deepen permanent pools known to be inhabited by several species of game fish.

2. We appreciate your consideration of Projects of Other Agencies, as discussed on page 14. However, we believe it would be helpful to also include a brief synopsis of other Soil Conservation Service projects in the immediate area (such as the Kickapoo Creek Watershed Project) that might affect or be affected by the works of improvement included in the proposed plan. This information would be helpful in resolving any questions the reviewer

might have concerning how other agency projects as well as Soil Conservation Service projects within the watershed may inter-relate and affect each other from an accumulative standpoint.

3. In considering the Bureau of Sport Fisheries and Wildlife (BSF&W) recommendation to fence the sediment pools of floodwater-retarding structures to control pollution from livestock, "The sponsors feel livestock will not be watering in sufficient numbers to cause a significant pollution problem nor detract materially from the fish and wildlife benefits to be derived from the pool areas of floodwater-retarding structures . . ." (page 17). Generally, we are in agreement with BSF&W's recommendations. Unconfined livestock are often a direct source of pollution to open surface waters. Fecal coliforms, other pathogenic bacteria, parasites and viruses are commonly excreted in the feces of livestock and might enter the floodwater-retarding structures in the watershed, the Paluxy River, and eventually the Brazos River. Also, to prevent any direct fecal contamination to the multipurpose structure for water supply to Glen Rose, we suggest that the movement of livestock be controlled (possibly by fencing) to prevent contamination of these waters. Additional information discussing this matter should be contained in the work plan.

4. The location of the 204 ponds to be installed to provide fish habitat and water for wildlife and livestock should be identified on the project map (Figure 6). Additional information should also be included in the Work Plan discussing the details of installing these ponds and evaluating the environmental impacts from construction operations.

5. Although borrow materials for the construction of embankments for the floodwater-retarding structures were classified by soil types, borrow areas should be identified and described, including what precautions and protective measures will be utilized in controlling any erosion that might occur in these areas.

Several environmental impacts associated with the proposed watershed project were discussed in the Draft Environmental Impact Statement. However, the following comments should be considered in strengthening the Final Environmental Impact Statement:

1. The comments discussed above as suggested for inclusion in the Work Plan should also be considered in the final statement.



2. The estimated schedule of obligations for the construction of the floodwater-retarding structures for the 8-year installation period (discussed on page 34 of the Work Plan) should be contained in the Final Environmental Impact Statement. A description of the order of construction for these structures would be helpful in assessing the anticipated environmental effects that will be generated during the individual completion of the floodwater-retarding and multipurpose structures.

3. In discussing the environmental impacts of the project, it was mentioned on page 20 that, "Economic impacts on the local area resulting from the project will include additional requirements of fertilizer." More information evaluating the potential secondary environmental impacts on the water quality of the Paluxy River and its tributary creeks, the multipurpose structure for water supply, and eventually the Brazos River, from the runoff of increased concentrations of fertilizer residues should be considered in the section, Environmental Impacts.


4. The no-action alternative (Alternative No. 5) was discussed only from the standpoint of the beneficial environmental impacts that would be foregone if the plan were not implemented. Equal consideration should also be given to discussing the environmental consequences that might be foregone if the no-action alternative were selected as the final plan of action.

These comments classify your Draft Environmental Impact Statement as LO-2. The classification and the date of our comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the attachment. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and on the adequacy of the impact statement at the draft stage, whenever possible. If you have any questions concerning our categorization procedures, please let us know.

We appreciate the opportunity to review the Draft Environmental Impact Statement. Please send us two copies of the Final Environmental Impact Statement at the same time it is sent to the Council on Environmental Quality.

Sincerely yours,

  
Arthur W. Busch  
Regional Administrator

Enclosure

## ENVIRONMENTAL IMPACT OF THE ACTION

### LO - Lack of Objections

EPA has no objections to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action.

### ER - Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to re-assess these aspects.

### EU - Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

## ADEQUACY OF THE IMPACT STATEMENT

### Category 1 - Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

### Category 2 - Insufficient Information

EPA believes the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

### Category 3 - Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement. If a draft statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make such a determination.





## EXECUTIVE DEPARTMENT

DIVISION OF PLANNING COORDINATION

BOX 12428, CAPITOL STATION

AUSTIN, TEXAS 78711

PHONE 512 475-2427

DOLPH BRISCOE

GOVERNOR

June 11, 1973

Mr. Kenneth E. Grant  
Administrator  
U. S. Department of Agriculture  
Washington, D.C. 20250

Dear Mr. Grant:

The Office of the Governor, Division of Planning Coordination (the State Planning and Development Clearinghouse), and interested or affected Texas State agencies have reviewed both the draft environmental statement and the work plan for Water shed Protection, Flood Prevention and Agricultural and Nonagricultural Management, Paluxy River Watershed, Texas.

The following comments are offered:

1. The Texas State Historical Survey Committee recommends that the following procedures be conducted in the project area prior to further consideration or construction:
  - a. Since the resource is unknown, an intensive archeological survey of the total project area must be conducted to locate, record, identify, and appraise the significance of the resource to be affected. This examination should provide, and result in, definition of research problems, costs, and strategy for further study leading to the mitigation of adverse effects on the resource.
  - b. Scientific recovery of information contained in cultural resources can mitigate the adverse affect of an action on the resource. An acceptable mitigation program should recover a reliable sample of all significant cultural and related ecological resources which will be affected through the use of a systematically prepared and explicitly stated research design under the direction of a competent professional archeologist. Measures other than recovery of the resource may be considered and may include protection of the resource through management measures, stabilization or no project action; all must be assessed from the perspective of preserving resources for future generations.

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2. The Texas Water Development Board recommends the consideration of the following issues:

- a. The environmental statement shows that significant changes will be made in runoff-patterns to Lake Whitney if this project is implemented. It is believed that the indicated 363,000 gpd municipal supply for Glen Rose is excessive for both the present and projected population. While reservoir site #26 is discussed as the source of municipal supply, no mention is made of permits from the Texas Water Rights Commission for the construction of the reservoir, or use of water for that purpose.
- b. On page 19, a discussion is given of present and proposed land use, which is tabulated as follows:

<u>Present Use</u>		<u>Proposed Use</u>	
Cropland	557 acres	Grassland	2,335 acres
Grassland	3,063 acres	Stream channel	250 acres
Stream channel	485 acres	Water areas	904 acres
		Dams & Spillways	359 acres

Despite the total reduction in cropland and a reduction of water, as shown on page 13, no mention is made of permits for irrigation water, nor the intended point of use.

- c. There has been a great amount of concern in other areas with respect to channel modification. We would question the advisability of changing 235 acres of channel in this particular project, and of clearing vegetation from an additional 1,263 acres.

3. The Texas Water Rights Commission reiterates their specific suggestions for incorporation in the work plan:

- a. Texas statutes do not require that a permit be obtained for a dam or reservoir constructed by the owner on his own property to impound or contain not to exceed 200 acre-feet of water for domestic and livestock uses when such dam or reservoir is not on a navigable stream. A permit is required when the converse conditions exist.
- b. Permits will be required for the storage and use of water from impoundments at proposed sites 16, 17, and 26, including the authority to use the bed and banks of Bowden Branch and the Paluxy River downstream from site 26. In addition, floodwater-retarding structures 1, 2, 5, 6, 7, 9, 13, 15, 18, 19, 20, 21, 22, 23, 24, and 25, listed in the work plan may have initial conservation storage space in excess of 200 acre-feet if the

Mr. Kenneth E. Grant  
June 11, 1973  
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embankment fill is taken from borrow areas within the reservoir basin below the invert of the service-outlet, in which case the proposed ungated outlet elevation may need to be lowered during the final planning stage.

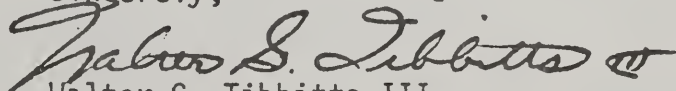
- c. There are extensive water rights in the Brazos River Basin downstream from the Paluxy River which are senior to any that may be acquired from the impoundments associated with the proposed work plan. Releases from storage may be required in the future for these senior rights during periods of water shortage, in addition to passage of normal flows for downstream riparian uses.
- d. From time-to-time the Texas Water Rights Commission receives complaints against persons for taking water from floodwater-retarding impoundments for irrigation of lands, for irrigation of the embankments of the dams (some of which are associated with overgrazing of the dams), for use in highway construction, and for use in construction of other floodwater-retarding structures. The Commission has no recourse but to investigate each complaint and, if it is found that unauthorized diversion and use of water is being made, to take the necessary action to halt such diversion and use.
- e. Rules of the Commission provide for appropriation of water for irrigation and other recurring beneficial uses through issuance of permits requiring several months for processing, and for use in construction through issuance of temporary permits requiring a minimum of administrative procedure.

4. The Texas Water Quality Board recommends that the proposed operation and maintenance agreement with project sponsors should also include specific recommendations for the surveillance of those structures where livestock watering might pose a pollution hazard.

The Division of Planning Coordination finds this proposed work plan, with the recommendations noted above, to be consistent with State planning and development policies and objectives. Each phase of the project is expected to be closely coordinated with the Texas State, regional and local agencies whose programs are affected.

Thank you for the opportunity to review this plan and the draft environmental impact statement.

Sincerely,



Walter G. Tibbitts III  
Acting Director

Mr. Kenneth E. Grant  
June 11, 1973  
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cc: Mr. Truett Latimer, TSHSC

Mr. Harry Burleigh, TWDB

Mr. Louis L. McDaniels, TWRC

Mr. Hugh C. Yantis, Jr., TWQB

Mr. Edward E. Thomas, SCS

Mr. Jerry Schrimsher  
Bosque Soil and Water Conservation District

Mr. Doyle Hutcheson  
Hood-Parker Soil and Water Conservation District

Hon. L. L. Martin  
Erath County Commissioners Court

Hon. Milton Meyer  
Hood County Commissioners Court

Hon. Temple Summers  
Somervell County Commissioners Court

Hon. Eugene G. Connally  
City of Glen Rose





